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ABSTRACT

Nine articles examine studies in Finnish higher education and the teaching of scientific thinking, with a focus on the relationship between university studies and career satisfaction. Information is presented on the years following the major expansion and reforms in the Finnish higher education system that took place in the mid-to-late 1960s. The articles are as follows: "Educational Career as a Transition Route to Adulthood" (Pentti Sirisalo); "University Studies as a Life-Cycle Stage and the Meaningfulness of the Study Process" (Helena Aittola and Tapio Aittola); "Orientations to Learning and the Study Environment" (Helena Rantanen); "Notes on the Concept of Knowledge from the Perspective of Epistemic Representations, Higher Education and Work" (Anna-Maija Pirttila-Backman); "University Didactics and the Learning of Scientific Thinking" (Pentti Hakkarainen); "Professionalism vs. Reflective Professional Practice" (Annikki Jarvinen); "Studying as a Life Phase and the Progress of Studies" (Raimo Makinen); "Adult Studies: Seeking for Status?" (Matti Parjanen); and "Eight Years After the Beginning of Class Teacher Education. Follow-up from Selection to Working Life" (Hannu Perho). (SM)

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Theory into practice 35

Raimo Mäkinen — Pentti Määttä
(eds.)

STUDENTS AND STUDYING IN HIGHER EDUCATION IN FINLAND

JYVÄSKYLÄN YLIOPISTO

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The nine articles of this collection examine the shaping of the study career in Finnish higher education, the experiencing of studies and the learning/teaching of scientific thinking. Also educational career before university studies and satisfaction with the profession acquired through academic education are dealt with. In the foreword a short description of the past development of the higher education system is given.

Descriptors: higher education, study career, university pedagogics, study experience

FOREWORD

The present collection of articles examines studies in Finnish higher education. With a view to readers who are not familiar with the Finnish educational system, it may be appropriate to mention a few central features in the development of higher education during the last two decades, which bear on this publication.

The mid 60s meant a crucial turning point in the higher education policy exercised in Finland. Following the quantitative increase of upper secondary school education, the number of new students in higher education had doubled since the mid 50s and the increase had been especially vigorous in the humanities and social sciences, the cheap fields of education. This "spontaneous" development did not meet the demands of the pressure for economic change in the society. The high student numbers had also led to mass studies. After a fairly short preparation period a bill was passed in 1966 on the development of the higher education system: the law and the related statute defined the development objectives pertaining to the quantitative dimensions of fields of education and to field-specific teacher-student ratios.

Since the end of the 1960s the starting places in institutions of higher education have been re-distributed in accordance with the development law, which has favoured "utilitarian sciences". In 1986, for example, when the development law was completely implemented, technical studies were commenced by 2.3 times as many students as in 1966, whereas the number of students who started studies in the humanities was only 68% of those who had started two decades earlier.

In accordance with the development law, also the teacher resources in higher education have been increased so that in 1986 the number of teachers was 3.1-fold compared with 1966. Since the number of new students has only increased 1.3 times, it seems that teaching has become more efficient as intended.

In order to guarantee effective participation in studying also the study support system was reorganized in the late 1960s. Of course, the government had even before that given grants to talented students with small means, but the extension of the support two decades ago, so that nearly everybody who wants can get a government-secured study loan, has above all aimed at an efficient use of study time in view of a degree.

Although the granting of the support, especially the small stipend connected with it, has involved a means test, it has been comparatively lenient. Hence it is not a support policy which aims at social equalization.

The reforming of the degree structure was a further effort to intensify studies. Also this reform was appropriately initiated in conjunction with the enactment of the development law, although its more detailed planning was carried out in the early 1970s and practical implementation in most fields at the end of the 1970s or the beginning of the 1980s.

In short, the reform of degrees has meant that in all fields of higher education, studies have been organized into so-called degree programmes, large-scale instruction themes which are pre-planned and have a certain professional relevance. The change brought about by degree programmes has been greatest in the humanities and social sciences where students could earlier construct their degree around the main subject with relatively few restrictions. The freedom of choice is not excluded in the new system either, but in practice most students choose a ready-made curriculum.

The rationalization of studies was, however, not the only purpose of the reform. Besides studies in the major subjects the programmes contain so-called general studies, which aim to broaden the basis of students' scientific thinking. The raising of the scientific level of education was also aimed at by the abolition of the intermediate degrees (B.A. level) after which many students had earlier entered working life permanently. So, as all students now have to prepare a small-scale scientific paper (M.A. thesis), the reform has meant an essential upgrading of the scientific level of education, especially in teacher education and in most of economics and management studies. On the other hand, the most common standard length - and at the same time the minimum - of basic degrees was prescribed as four study years.

Evaluations of the effects of the degree reform have been contradictory. The reform has aroused conflicting feelings particularly in the field of the humanities and social sciences, where it has been considered benefit-oriented. In fields that were already clearly professionalistic the reform has often only meant the addition of general studies to the study programme. Secondly, the reform is still so young, that research-based data on its effects are limited. However, preliminary observations and evaluations seem to indicate that although the reform sought to

integrate the teaching plan and to enable concentration on the essential, the end result has rather been the fragmentation of study contents and the expansion of degrees. On the other hand, there are signs that the reform has made the duration of studies more uniform without lengthening it. Hence, as dropout has not increased despite the abolition of the intermediate degree, new basic degrees are attained in nearly the same time and quantity as the old lower degrees were. Since the degree reform was, however, basicly a reform of the system, and the increasing of the number of teachers did not change studies in any other ways expect by increasing teaching, we are still faced with the actual pedagogical development work. First harbingers of this are the experiments initiated in some institutions of higher education, which seek to find new study forms without letting the earlier rules about lectures, seminars and tutorials and their organization bind the work.

The overall quantitative dimensions of the higher education system are also being re-assessed. Either intentionally or unintentionally the implementation of the development law led not only to the re-distribution of starting places among fields but also to a halt in the growth of the whole system of higher education in the early 1970s. While the number of new students doubled from 1956 to 1966, the increase from 1966 to 1986 was scarcely 30%, and moreover this occurred at the beginning of the 1970s. In fact the increase has been even smaller, for only half of it has been real. The other half has originated from the incorporation of already existing educational units into the system of higher education (class teacher education and universities of art). As the upper secondary education qualifying for higher education has, however, expanded all the time, the result has been an increasing number of matriculated students who have had to contend themselves with vocational secondary-level education instead of the aspired higher education. That this solution has been a forced one for many is manifested in that quite a few matriculated students who have entered vocational secondary-level education have later applied for and been admitted to higher education. At the system level a solution for this problem may in future be sought in a redefinition of higher education, in the changing of institute-level education to vocational higher education (cf. German Fachhochschule or Swedish postgymnasial utbildning). The Ministry of Education has recently opened a discussion on the issue. At the individual level the system - if and when realized - does of course not solve the problem which the strict limits of academic education have still left in the Finnish

educational system: the skewness of the social background of students in the most highly aspired education.

The articles of this collection do not try to systematically assess how the above mentioned development measures, restrictions and reforms have altered higher education studies or how they are manifested in student culture. The articles do not form a coherant entity when viewed from any other vantage point either. Central themes that are more or less closely associated with each other are, however, the shaping of the study career, the experiencing of studies and the learning/teaching of scientific thinking. The articles have been compiled in a kind of ascending order so that the first section examines the educational career before higher education. The second section contains a couple of articles that outline a picture of how students experience higher education. The third section is concerned with the instructional gist of higher education, the learning of scientific thinking. The fourth section returns to the study career, examining it on the basis of statistics, on the one hand, and from the subjective viewpoint of one growing special group, adult students, on the other hand. In a way the section sketches one perspective to the future of higher education. The last section contains one article which examines the career after higher education, satisfaction with the profession acquired through education in the light of vocational orientation preceding studies. The example is taken from teacher education. - Partly similar questions as here have been examined earlier in a publication by the Institute for Educational Research 'Recent Finnish Research on Higher Education 1985'.

Tuula Granberg has translated the articles by Sinisalo, Mäkinen and H. and T. Aittola. Hakkarainen's article has been translated by Liisa Havola. Liisa Hughes has translated the foreword and the articles by Rantanen, Järvinen and Perho, and checked the language of the remaining articles. Word processing has been done by Matti Taajamo and Sinikka Vihne. The Ministry of Education has supported the publication financially.

Jyväskylä May 1, 1989

Raimo Mäkinen
Pentti Määttä

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PART I

Pentti Sinisalo
EDUCATIONAL CAREER AS A TRANSITION ROUTE TO ADULTHOOD

Educational career as a transition route to adulthood

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The paper is based on an 8 year follow-up of one age group of young people (n=590) who had finished the comprehensive school in 1975 in North-Karelia in south-eastern Finland. During the follow-up the adolescents progressed from the age of 15 to 24. Four career lines are constructed on the basis of the educational, employment and unemployment histories of the adolescents: stable working career (49 % of the cohort), unstable working career (21 %), stagnated working career (4 %) and educational career (25 %). The development of the educational career has been described and compared with two follow-up studies of upper secondary school graduates in the late 1960s and early 1970s. A change has taken place in the relationship between education and gender; the increasingly high level of women basic schooling is partly also reflected in the growing share of women in higher education. The recruitment of female graduates from the upper secondary school into further education revealed a model involving a several-year-long, intermittent application process. The pattern is different from the educational career of men. The research also indicates that it is already more common for secondary upper school graduates to take up a place in other forms of education than in higher education. The vocational orientation, orientation towards work, and the structure and orientation of life in the educational career was found to be different from the other career lines.

1. Introduction

Youth is an autonomous phase of life, which has its characteristic psychosocial meaning, developmental tasks and tensions. Goals, hopes and plans play a very central role in young people's lives. A young person is still in a way searching for his or her place in society. He has to make various choices, the most crucial of which concern education and work. For the first time in his life the young person also has the prerequisitic for planning and realizing his own goals. This is made possible by the

development of thought processes and cognitive skills. It is reflected, among other things, in the restructuring of the world view and in an increased knowledge of the world. An individual's social environment also starts to steer the young person towards socially useful careers. The youth are beginning to formulate their motives and interests in life. Part of these are adopted to satisfy the demands of the environment, others rise to oppose the requirements and yet another part emerges in spite of those demands.

The developmental tasks of youth also include the achievement of economic and psychosocial independence, one gradually breaks away from the childhood home, creates a new home, establishes a permanent pair relationship and sets up a family. All this radically changes the content of young people's life situation. Considerable changes occur in the significance of many things; the hierarchical structure of life's functions undergoes an alteration.

2. Career lines

The succession of education/training and occupational tasks has traditionally been described as a career (e.g. Form and Miller 1949; Super 1957). From the perspective of the development of a persons's life course, career has a dual nature. In the first place, it describes the structural frame factors of man's life course. In this sense, I am going to use the term career line. A career line is a succession of education and occupational tasks which a group of young people have in common and which can be empirically observed (Spilerman 1977; Sinisalo 1986). A career line is a structural social phenomenon which undergoes historical changes. This view is based on the sociological research tradition in the study of life course. On the other hand, the psychological approach to the study of life course sees a career as the life-course process, the social life-history of an individual. This involves the choices and decisions made by an individual regarding his life, education and work, as well as the results he or she achieves in these fields.

The present paper is based on the writer's investigation which focused on monitoring the development of the educational and vocational careers and life courses of one comprehensive school age-cohort, after the completion of their compulsory schooling. The target group consisted of the age cohort which had finished the comprehensive school in 1975 in four municipalities representing North-Karelia, namely, Eno, Joensuu, Juuka and Kitee. In 1977, two years after they had left the comprehensive school, 87 % or 787 students were located and interviewed. The second follow-up study was conducted in 1983-84, when a mail enquiry was sent to all those who had been interviewed in the first follow-up phase. A total of 590 young individuals returned the questionnaire (65 % of the 1975 population). The follow-up study thus covers the age range from 15 to 24 years of age, in other words, the developmental stage in which young people undergo the transition from adolescence to early adulthood and start looking for their place in society and in the world of work (for more details, see Sinisalo 1986).

Based on the principal activities pursued by the young subjects during 1977-1983, it was possible to construct four career lines on the basis of their educational, working, and unemployment histories. These constitute the structural frame factors of the young people's life course. Those young people who had a *stable working career* (49 %) had proceeded through vocational schooling/training (a small part without any schooling) permanently into working life without any major interruptions, periods of unemployment, or changes of jobs. The young persons who had an *unstable working career* (21 %) were characterized by a continual search for a permanent occupation, via short-term jobs which often were not in keeping with their training and/or via jobs maintained by state employment subsidies. From the viewpoint of a young person's development, the most problematic career line is the *stagnated working career* (4 %), characterized by high unemployment and stagnation of one's labour career and life course. The fourth career line is the *educational career* (25 %), where the young had spent practically all their post-comprehensive-school years in some educational programmes, a little over half of them in higher education.

3. The development of the educational career

The above described career lines are clearly distinguished from each other by basic schooling. A total of 84 % of the students in the educational career had graduated from the upper secondary school, whereas in the stagnated working career only 12 %, in the unstable 27 %, and in the stable working career 33 % had finished the upper secondary school. Upper secondary school education was also clearly more common among girls than boys; more than half of the girls (52 %) finished the upper secondary school, while only a spare third (31 %) of the boys did the same. The following discussion focuses on the examination of further studies conducted after basic schooling.

An investigation by Merja Koivuluhta (1987), which focused on the sub-group of students who had completed some type of vocational education on the lower secondary level, indicated that 16 % of upper secondary school graduates had, by the year 1983, gone through lower secondary level vocational education. Girls ended up at the lower secondary level clearly more often than boys: of the 41 students only 7 were boys. According to Koivuluhta's findings, boys and girls who had completed the upper secondary school followed different paths to lower secondary vocational education. Girls had sought entrance to nursing professions, where access to the higher secondary level educational programmes was restricted by keen selection. Consequently, they ended up at the lower educational levels of the nursing professions. Boys, in contrast, had sought access to some special field, where no higher level education was available, or to those lines in vocational schools which were very popular or difficult to enter.

Another sub-group study focused on graduates from higher secondary level education in the fields of nursing, commerce and office work as well as technology (Hartikainen et al. 1985). An ample half of this group (57 %) had completed the upper secondary school. A total of 31 % of all upper secondary school graduates had continued their studies in these educational fields on the higher secondary level. A majority of them were also women; the share of women was 61 %. This does not, however, exceed very much their relative proportion of the entire age cohort, the sex-based difference was not significant here. It is well-

known that gender assigns people to different fields: 72 % of the men had received training in the field of technology, whereas 59 % of the women had studied in the fields of commerce and office work and 38 % in the field of nursing.

In the sub-group studied by Hartikainen et al. a little over half of the students had received earlier training during the period between their basic schooling and their latest vocational education. This was true of as many as two out of three students who had studied in the fields of nursing and technology. The entrance to the nursing field was preceeded by studies in home economics and in folk high schools, while those in technological education had studied in vocational schools (in fields related to metal, electricity, telephone work etc.) and these studies meshed seamlessly with their studies on the higher secondary level. It is worth noticing that all those who studied in the nursing field had completed the upper secondary school, whereas only little more than half of the students in the technical field had done so. Thus, the path to higher level educational programmes for those whose basic schooling does not include the upper secondary school, goes through the vocational school.

A total of 54 % of the young people in the educational career were studying in higher education (63 % of the girls and 45 % of the boys). The share of girls is here somewhat larger than their proportion of the entire age cohort.

The result is the opposite of the findings made by Sysiharju (1972) and Luukkonen and Isohanni (1979) in their follow-up studies. The upper secondary school study of Sysiharju concentrated on the monitoring of the lives of young people who, in 1964, had been on the final grade of the lower secondary school, for a period of six years. Her study thus represents the generation of upper secondary school graduates from the late 1960s, while my own research concerns young people from the late 1970s. Of the group followed up by Sysiharju, 46 % graduated from the upper secondary school. When six years had passed since the final grade of the lower secondary school, two thirds of the students who had passed the student exam, were still in the sphere of education (45 % in higher education), and only just one fifth were in working life. Looking at the entire group, a greater part of the boys, in comparison with the girls, had found a place in educational programmes. Among upper seecondary school graduates a much greater share of the boys than girls were in

higher education. Girls tended to settle in the world of work sooner, through a shorter vocational schooling. Luukkonen and Isohanni made very similar observations in a five year follow-up study concerning matriculands of the 1971 student examinations. At the end of the follow-up period, only about 40 % of the students were in gainful employment. A total of 55 % were in schooling, being divided as follows: 42 % in higher education and 13 % in vocational institutions. During the whole 5-year-monitoring period, 68 % of the boys and 47 % of the girls qualified for higher education studies.

The studies of both Sysiharju and Luukkonen & Isohanni indicated that it was a relatively small number of upper secondary school graduates who participated in vocational training below higher education level. Also, the male graduates from the upper secondary school had found access to higher education studies more often than females. In the present study the girls in the educational career are more often situated in higher education studies than boys. Although the educational career in my investigation is not quite exclusively the career path of upper secondary school graduates - only 16 %, however, had less schooling - the comparison reflects the change that has taken place in the relationship of education and gender, the change which is still in progress in Finland. The increasingly high level of women's basic schooling, the female majority in upper secondary schools, is partly also reflected in the growing share of women in higher education: nowadays a little bit more than a half of all new students are women. These are phenomena which must also be taken into consideration in research. My research also indicates that it is already more common for upper secondary school graduates to take up a place in other forms of education than in higher education. The trend is however still relatively moderate. The tightened competition for student places in higher education may have brought about considerable changes in the initiation of vocational careers for upper secondary school graduates later in the 1980s.

The above-described career lines reflect those structural frame factors in the lives of young people, that change along with the development of society. On the one hand, the educational career is dependent primarily on the development of the educational system. The target cohort is the last age group in North-Karelia which went through the old parallel school system, although administratively the transition to

the comprehensive school system had already taken place. No major reforms had occured in the structure of vocational education at the time when these students finished the basic school or the upper secondary school. However, since the growth in the numbers of upper secondary school graduates did not result in a corresponding increase in student places in higher education, measures were taken to create more places for these students in secondary level vocational education.

On the other hand, development trends in industrial life and in the labour market also have their impact on people's career development, although the educational career can not be seen as a vocational career in the strict sense of the word (it is also a phase of preparation for adulthood activities in society). One of the tasks for future research is to find out, what kinds of career lines open for students in the educational career. It is obvious that not everyone follows the same routes onwards from the higher education level. Acadamic unemployment is a well-known fact, on the other hand there are the top careers in the various sectors of society and industry. What is involved here are very subtle factors connected with the structural development of society. What effects, for example, does the segmentation of the labour market have on higher education graduates? What kinds of structural careers can be identified in the life courses of people with higher education degrees? What are the relative proportions of identifiable career lines among people who have received higher education? What is the role of self-selection in comparison with the impact of institutionalized steering and selection systems?

I shall take one example to illustrate the impact of actions taken by society on the career development of a certain group. There is evidence of an interesting, genderrelated feature in the development of the educational career. During the follow-up period from 1977 to 1983, the women in the educational career line had been in gainful employment more often than men. After completing the upper secondary school, the women rather frequently held temporary jobs, many of which were municipal or government subsidized employment jobs. In the mid 1970s youth unemployment rapidly reached a very high level, where it has ever since remained. At that time, various employment measures were created to help mitigate the effects of youth unemployment. What resulted was that a high proportion of those who were most capable of utilizing the

system created for the employment of the unemployed, included women with high basic training. This was due to the nature of these jobs: they were mainly jobs in the fields of health care, social work and various office jobs, in other words, precisely those occupations that girls tend to favour. Furthermore, these jobs required good basic schooling.

In the present study the women had also participated in a number of training programmes and taken jobs in between these courses more often than the men. One rather typical pattern of the educational career for female graduates from the upper secondary school, before entering training in the nursing professions, involved participation in some lower secondary level training programmes in the hotel and catering trade, the most typical study places being schools of domestic science. The multiple schooling of women, in the fields favoured by them, was in part related to the selection systems and keen screening processes of those fields, which may result in years and years of recurrent application attempts. As pointed out earlier, this also results, relatively often, in the choice of corresponding schooling on the lower level when the path is blocked on the higher level (Koivuluhta 1987). In contrast, it was not equally common for male upper secondary school graduates to participate in multiple schooling, which is due, at least partly, to the fact that men's educational preferences are directed to wider areas, thus avoiding more extensive selection measures. The recruitment of female graduates from the upper secondary school into further education thus revealed a distictive career pattern involving a several years long, intermittent application process.

Also in higher education, the life courses of men and women seem to follow different development lines. In his follow-up study of academic careers, Häyrynen (1986) found that a disconnected career development, characterized by many setbacks, was more typical to females than males. On the one hand, this is caused by women's commitment to the family and their children, on the other, by their placement in work tasks involving temporary work relationships or unfavourable career development.

Thus, gender as a social factor seems to determine one's career development. In the 1980s we are, however, facing different prospects. Upper secondary schools have become increasingly predominated by girls, the level of women's basic schooling has risen enormously, and because of

this, girls are more often than boys qualifield for higher education studies. Parallel to these developments, the issues concerning equality between the sexes have forcibly emerged also into the labour market; the feminist movement has, in many ways, become part of people's general consciousness. It may be anticipated that these two trends will help to produce new types of career patterns for the educated women. One central task, when we continue the monitoring of young people's life courses in the educational career, as they move into adulthood and start looking for their places in working life, is to find out the extent and nature of change in the social impact of gender on the formation of career patterns, which was observed in the upper secondary school generation from the 1960s, monitored by Häyrynen. It is quite possible that some changes are discernible already in the life course of the academically educated age group which I have examined, although these change and development processes demand time. On the whole, even the research results that have been discussed here indicate quite convincingly that the career developments of men and women must be examined separately, because they differ so much from each other, and because so many new factors have emerged in the development of society, which contribute to the shaping of women's career patterns, in particular.

4. The educational and work orientation of young people

What, then, were the processes which had led young people to their present careers? Obviously, people's own actions, decisions and choices are important influences in their recruitment into different careers. In 1977 students were asked, on what grounds they had made their educational choice. Even this enquiry clearly revealed the special nature of the educational career: a very dominating justification offered for the choice of this line involved further education opportunities, while those in the other career lines commonly prioritized their interest in the field. Naturally, it must be remembered that the upper secondary school, which was the main post-comprehensive school educational channel chosen by students in the educational career, creates only the prerequisites for

further education. At the stage of their basic schooling the vocational orientation of the recruits in the educational career was directed strongly towards higher education studies. As many as three fourths of these young people, in the 1977 interview, thought that they would most probably seek access to higher education studies. This is clearly more than among the entire group of upper secondary students, where two thirds were planning to enter higher education studies. In the 1970s competition for university places continued to accelerate. In the lives of these young people this is reflected by the fact that eventually only 53 % of them were able to realize their plans of higher education studies, which is a substantially less than the percentage of those who had been planning for higher education studies on the second grade of the upper secondary school. We must, of course, take into consideration that vocational plans, made at that period in students' lives, are not yet very cler or final (e.g. Kosonen 1983). It is noteworthy that an equal number of boys and girls had higher education plans at the time; there was no sex-based distinction in this respect.

The different vocational orientation of the educational career youth is also reflected in their orientation towards work. In order to investigate the work orientation of these young people, they were asked to assess the importance they attached to different aspects of work. Two basic forms of orientation were distinguished in the attitudes to work. Central features in the *professional work orientation* included the internal qualities of work, such as opportunities of using acquired knowledge and skills, interestingness and variability. *The wage work orientation*, on the other hand, puts greater emphasis on the external aspects of work, such as working conditions and work stress. The professional work orientation was typical to the educational career. It is significant that, during the follow-up period when the students were in training, this orientation became stronger; the distinction between the other career lines increased (table 1). This seems to indicate that education really enhances the kind of vocational orientation where the development and use of qualifications are central. It is also closely linked to people's general life orientation which, for the educational career youth, essentially involves self-development. This is indicated by the examination of the hierarchical structure of life's activities, although it was not possible, in this phase of the study, to conduct a deeper analysis of this question. The observation is nevertheless interesting in itself.

TABLE 1. The prioritized qualities of work in 1977 and 1983 (Factor-specific sums of scores by career lines. The higher the score the more salient the feature)

	1977 Career line			
	A	B	C	D
Opportunities for utilization of qualifications	4.02	3.96	3.72	4.02
Working conditions	4.52	4.57	4.02	4.05
Development at work	4.22	4.12	4.02	4.06
Stress	3.08	3.14	3.25	2.72*
Interestingness and variability	4.50	4.40	4.15	4.51*
Independence	3.84	3.69	3.65	3.88*

	1983 Career line			
	A	B	C	D
Opportunities for utilization of qualifications	4.15	4.02	3.75	4.24*
Working conditions	4.24	4.33	4.25	4.00*
Development at work	3.82	3.75	3.73	3.77*
Interestingness and variability	4.24	4.11	3.92	4.29*
Stress	3.21	3.18	3.55	2.67*
Rewards	3.94	3.90	3.98	3.74*

* Significant difference, $p < .05$, one-way analysis of variance
A = Stable working career, B = Unstable working career,
C = Stagnated working career, D = Educational career.

There was a very clear connection between the socioeconomic background of students and their recruitment into the different levels of education. The recruits to higher education came relatively more often from the upper socioeconomic groups. Students recruited to different educational levels were also distinguished by their living environment and its stage of development. Young people on the higher levels of education came relatively more often from densely populated areas, whereas the youth from underdeveloped and remote districts with scattered population ended up on the lower educational levels and were more often excluded from post-compulsory education. Measures designed to equalize regional differences have not succeeded in eliminating these structural differences, which were still quite prominent in the 1980s. On the other hand, its is true that no rapid changes can be expected to occur in sociocultural values and attitudes, which are transmitted to the youth through the socialization process and which have an extensive influence on their life orientation and, more specifically, on their vocational orientations. The findings of the study indicate that these factors seem to lag behind the changes that are taking place in economic life and in the means of production.

5. The educational career as life situation

Chronological age is a poor criterion of the transition to adulthood. This can be clearly illustrated by the comparison of the different career lines in regard to certain central characteristics of adult's life situation. One characteristic feature of adult life is holding a job. At the time of the research, in 1983, when the average age of the cohort was 24 years, five out of six females and almost four out of five males in the educational career were still students. In the other career lines gainful employment started to be dominant; the relative shares of those who were gainfully employed varied from 83 % of the males in the stable working career to the 38 % of the females in the stagnated working career. The distribution was thus very great. Contrary to the educational career, the alternative of gainful employment in the stagnated working career was unemployment.

This is also reflected in the very significant differences in the phenomenological content of people's life situation between these two career lines.

In 1982 women in Finland contracted their first marriage at the average age of 24.8, and the men two years later, at the age of 26.8. Nearly one half of the age group in question were married or living with a partner at the time of the enquiry in 1983, when they were 24 years old.

Even in this respect the life situation of those in the educational career differs strongly from the other career lines; only a generous fifth part of them were married or living with someone. On the whole, this examination indicates that the process of becoming independent lags clearly behind in comparison to the youth in the stable and the unstable working careers. Externally, the situation appears to be similar also in the stagnated working career. As I said before, the psychosocial content of the life situation is nevertheless totally different in these two career lines (table 2).

TABLE 2. Importance of life domains (Factor-specific sums of scores by career lines. The higher the socre the more important the domain)

	Career line			
	A	B	C	D
Self-development	3.04	3.05	2.77	3.56 *
Social activity	2.40	2.52	2.11	2.50
Family	4.22	4.22	4.12	3.47 *
Economic position	4.35	4.32	4.50	3.79 *
Physical activity and outdoor exercise	3.42	3.49	3.18	3.39

* Significant difference, $p < .05$; one-way analysis of variance
A = Stable working career, B = Unstable working career,
C = Stagnated working career, D = Educational career.

Activities related to self-development were more important to the young people in the educational career than in the other career lines. Being in the sphere of education also signifies that the life situation of youth still continues. Such life activities as family, work and economic position, which are part of early adulthood, are much more distant than in the other career lines. The structure and orientation of life resembles more closely that of adolescence than adulthood. Whereas the respondents in the other career lines prioritized gainful employment and family, those in the educational career gave the first place to human relationships (figure 1).

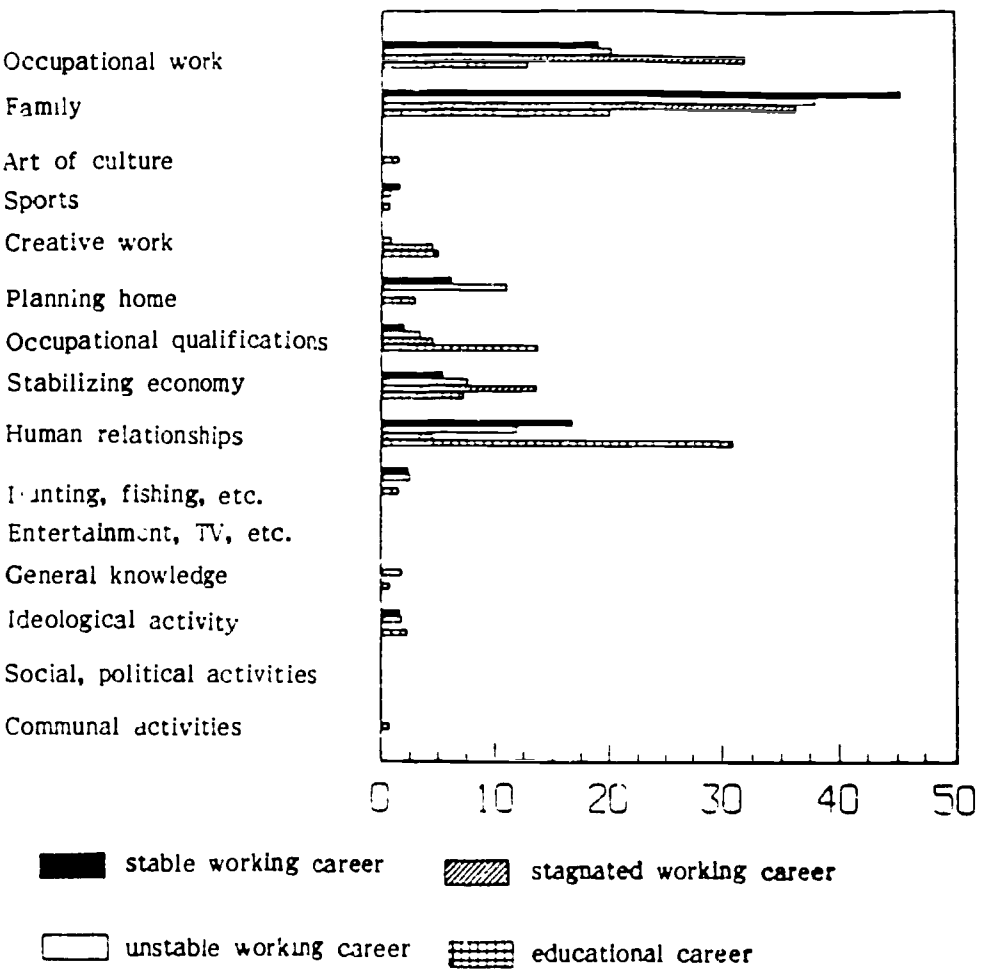

FIGURE 1. The most important domains of life activities by career lines (%)

6. Discussion

One of the most important findings of the study presented in this paper involves the structural career lines. Career lines can be examined as transition routes to adulthood. In this respect the educational career differs very clearly from the other career lines. The young people in the actual working careers had already made the transition, or were obviously in the process of making the transition to early adulthood. The life situation of those in the educational career was a students' life situation, bearing greater resemblance to late adolescence than to adulthood. In view of the future development of life course it is necessary to ask, how does the career development of the sudents in the educational career proceed from here on? What kinds of career lines are available for them in the Finnish society, as they move into adulthood and working life? What are the most important social changes which determine career lines?

As regards vocational career, in particular, the development of the labour market and production processes are of special importance, as well as the changes which take place in education and in the educational systems. Another central area comprises the relationships between education and the world of work. Instead of being a passive prisoner of his social environment, man functions in active interplay with it. The third crucial issue thus concerns man's activity as the subject of his own life, in other words, the control he exercises over his life and life changes, and the way he accepts the challenges created by the changes.

New occupations are created and others are destroyed by the development of production technology and production processes. Some of the new occupations may be short-lived and become rapidly obsolete, while other are more permanent. This sets new requirements on the vocational qualifications of people who are active in working life. They must continuosly acquire new knowledge, skills and capabilities. This applies especially to higher education vocations. To what extent do various educational and vocational fields differ from each other in this respect? Are some fields under greater change pressures than others, and how do the changes affect the development of career patterns? Evidently a new type of career pattern will be one that is dominated by the alternation of education and work, in one form or another. As we all

know, there is a very active debate today about life-long education or permanent education and schooling, even at the level of formal educational systems.

A second vision is related to the functioning of the labour market. In the western world, the current discussion concerns the distribution of employment. A so-called dual society has been seen as one possible development trend, which means that society is divided into two sectors: the hard production sector, responsible for material production, and the soft sector which functions to renew the hard sector.

Another aspect is the sufficiency of work; is there work for everybody? There is a sector where work is available, and it is more demanding and more rewarding. Part of the citizens are left outside this sector either by their own volition, or because of their inadequate or wrong qualifications. Tied in with this is also the alternation of being in and out of work and the temporal division of work: will new kinds of part-time work forms emerge? Segmentation development will, however, probably be more complex than a simple polarization process. What is most essential, is the impact that this sort of development has on the shaping of career patterns.

The discussion is often linked to the differences between educational levels and to the differences between the educated and the uneducated; those with higher education and, more generally, those who have received vocational training occupy the better sectors, while the uneducated and those with less education must take the worse segments. It is however possible to think that segmentation is also occuring within the group of higher education graduates. How is it reflected in the career patterns? Are there career patterns which are characterized by stable, progressive advancement? What about those fragmentary or even stagnant or outdated career patterns? Do there exist career patterns where work and out-of-work periods alternate? Furthermore, are there career patterns characterized by permanent education, where participation in work and training are realized? What are the relative shares of different career patterns?

A very important point of view involves the differences between female and male career patterns. Many investigations, also ones related to those with academic education, have indicated that there are differences in the career development of women and men. What is the relationship

between this issue and the future development of society?

Finally, a few words about questions that are important from the viewpoint of the psychosocial development of an individual. The most fundamental questions, from the perspective of psychological life-course research, are focused on man's activity as the subject of his own life. It is thus the questions connected with the control of life that emerge here. How can man respond to changes in his environment? How can he function in active interaction with his changing environment? What is the role of self-direction in this development? How is it possible to influence it? Education is one tool that can be used to create the resources that are necessary for controlling life.

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PART II

University studies as a life-cycle stage and the meaningfulness of the study process

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This article is based on studies of university students in Jyväskylä, conducted by the authors in 1981, 1984 and 1986. The series of studies has focused on finding out how students experience the meaningfulness of university studies as well as on clarifying what the basic structures of students' life-world are, how their scientific thinking develops, and what characterizes the period of university studies as a stage of life. The data have been collected by interviewing a total of 204 students who were at different stages in their studies and represented different disciplines. The method was a semi-structured thematic interview, and the data were analysed by using both qualitative and quantitative methods. What follows is a summary of the main theoretical starting points of the studies and their major empirical findings.

1. Study process as a stage of life

The life stage of university students and the life changes associated with them can be gererally described as the process of becoming adult or, following Bourdieu and Passeron (1979, 46) and Levinson (1978, 71-111), as a stage of intellectual noviciate, when students can experiment and make provisional choices before forming a more stable way of life and life structure. During their time of study university students encounter general developmental tasks and life changes related to the transition to adulthood, but in a way which differs somewhat from the processes of those young people who transfer to the working life after a shorter period of studies (Chickering & Havighurst 1981, 17-25).

Various conflicts and crises are normal events in people's lives. Transitions from one life stage to another are characterised by such critical events (Erikson 1980, 108-175). The many changes that occur in the life stage of students, and the resulting conflicts with the social

status of students, explain the tensions between university studies and the life during the study time. These conflicting tendencies come to light in the analysis made by Chickering and Havighurst (1981, 30-38) of the developmental tasks of the study stage. According to this analysis, students meet and have to solve two kinds of developmental tasks, the first of which are related to late adolescence and the others to early adulthood. These life stages and the life changes realized within them, have been illustrated in Table 1.

TABLE 1. Life changes involved in the period of studying

Late adolescence (years 16-23)	Early adulthood (years 24-35)
- attaining emotional independence	- choice of spouse
- preparing for marriage and married life	- forming a family
- choice of occupation and studying for it	- getting a home and starting a family life
- developing an ethical world view	- transition to working life
	- fulfilling civic duties and finding one's place in society

Studying is started at a stage in one's life when many different questions are actualised, which have to do with various aspects of independence, emotional growth and choice of occupation. Towards the end of the period of studying a variety of decisions are awaiting: choice of spouse, creating a family, getting a home, transferring to the labour market, and entering the role of an adult (Chickering and Havighurst 1981, 30). The main part of the study time can be characterised as an indefinite time when students are in-between different stages, occupied mostly with studying and student life. The indefiniteness of students' social status makes it possible for them to enjoy the kinds of freedoms that other young people, who are already gainfully employed, cannot entertain. But, by the same token, they remain longer in the role of adolescence, because they are financially dependent on the study support

or their parents (Aittola, 1986, 24-53; Aittola & Aittola 1985, 100-146; Levinson 1978, 71-89).

2. Starting points of research on meaningfulness

Research on the experience of meaningfulness of university studies is exploratory in character and requires an interdisciplinary approach. The meaningfulness of studying and learning proved a very complex object of research, since so many things can be felt to be either meaningful or meaningless (Frankl 1983; Rauhala 1974). A theoretical and conceptual analysis of the meaningfulness phenomenon was necessary in order to solve the several theoretical and methodological problems inherent in the study. It was also necessary to explore the targets which were experienced as meaningful, since, as Marton and Svensson (1979, 471-486) have stressed, studying and learning have to be examined from the point of view of the learner: his or her experiences of and relations with the surrounding world must be investigated.

The way people experience the meaningfulness and relevance of university studies is guided by personal interests and relevance structures, which determine which matters or learning topics may prove meaningful at any particular point of time. The cognitive processes that build up learning can be understood as perceptual cycles, as analysed by Neisser (1982, 93-97). People are always confronted with much more information than they can attend to, at any given point of time, and for this reason they must pick up those items that appear the most relevant. Schutz (1970, 26-71) has made an analytical distinction between motivation-based volitional relevance, socially imposed thematic relevance, and interpretational relevance, which are all basic preconditions of experiencing relevance. This means that students should be able to find that university studies serve their own interests and to see the topics to be learned as worthy of learning, and they should furthermore have sufficient prior knowledge for interpreting them (see e.g., Ausubel et al. 1978, 40-45).

The meaningfulness of university studies is a multi-level phenomenological and cognitive lived experience, which, following Olkinuora (1979, 53-58; 1983, 18-22) and Aittola and Aittola (1985, 69-73) can be defined as

> a sense of meaningfulness of themes, acts and activities encountered in university studies and experiencing them serving students' different interests as well as an experience of coping with the study process so that it is felt to lead to the attainment of desirable goals.

The meaningfulness of university studies is a subjective experience of students indicating that there is some sense and reason in the subjects that they study and the acts they do and activities they undertake to learn them. A lived experience of meaningfulness also presupposes that students have an opportunity to influence their own studying so that it serves their own goals and objectives (Ausubel at al. 1978, 494-497; Fransson 1977, 244-257; Ramsden 1981, 220-263).

The foundation of experiencing studying and learning as meaningful, consists of all those factors of students' study and life situation within whose constraints their everyday life and studying actually take place. According to Husserl (1978, 121-147) and Schutz (1975, 116-132) this daily life context of students could be called their life-world, since life-world is the basis and the embodiment of all meaningful human action. Students' life-world and its basic structures can be illustrated by means of a figure (Figure 1), which displays those factors that are central in the life situation, study situation and study process of students.

The life-world of students consists first and foremost of all those factors that are related to their life situation, to the university and the subject matter to be studied which frame and determine their lives and give it significance. Life-world, according to Routila (1979, 169-194), can be described as a kind of "field of possibilities", in which students' own acts and actions as well as events in the surrounding world both open and close different possibilities of action. (Aittola & Aittola 1984, 242-251; Aittola & Aittola 1986, 8-75.)

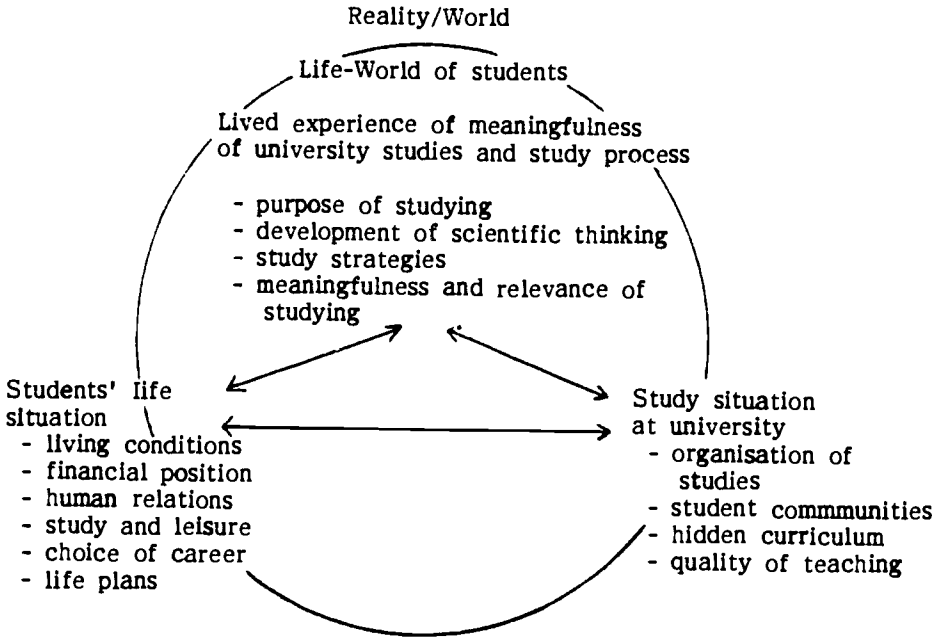

FIGURE 1. Lived experience of meaningfulness of university studies and the basic structures of students' life-world

3. Formation of students' identity

One of the main objectives of university studies is to develop the scientific thinking of students through the content of study programs. Studying is also expected to expand, deepen and enrich the students' world view (Perry 1970, 57-200; Weathersby 1981, 51-74). The analysis of a meaningful learning process also presupposes an identification of the ways in which students process information included in their study programs. Marton et al. (1980, 14) suggest that learning is an activity that transforms people's conceptions of events and phenomena around them. Phenomenologically, learning can be defined as the process of developing meaning relations in which new ideas are linked to and also derive their meaning within the horizons, or meaning relations, of prior knowledge and prior experience, but they also modify students' cognitive

structures (Ausubel. et al. 1978, 40-49; Colaizzi 1973, 49-145). Thus the acquisition of new facts is not the most important aspect of studying, but rather the deepening and enrichment of earlier knowledge and views (Aittola & Aittola 1985, 8-68; Häyrynen 1984, 27-65; Saari & Majander 1985, 42-112).

Students' prior learning history and their university studies help to form their conceptions regarding their ability to guide their own lives and study processes. Rotter's (1966, 1-28) analyses of internally and externally controlled activity and learning can be applied to the study of the meaningfulness of studying and learning, because students' experiences and views of their own scope of influence and control are associated with their mode of studying and their learning results. Internally controlled studying and learning have generally been found to produce qualitatively deeper and more lasting learning results than externally controlled learning (Fransson 1977, 244-257).

Students meta-learn various modes of action and attitudinal responses relating to their own future and its possibilities. This kind of metalearning can produce life strategies that rely on active and internally guided processes, but it can also produce passive and externally guided learned helplessness. New areas of personal growth are thus opened up for students, but correspondingly, some other options are also closed down (Lundgren 1979 39; Routila 1979, 165-194). Metacognition concretises the dual nature of study processes at university level: students learn new things through different disciplines, but at the same time they have to realize the limits of their abilities and possibilities (Broady 1985, 96-173; Rauste-von Wright 1983, 96-106).

4. Basic structures of students' life-world

The totality of students' life situation, study situation and study processes can be called their everyday life-world. Table 2 summarises the major changes in the basic structure of life-world discovered in our studies (Aittola & Aittola 1985, 99-244; Aittola 1986, 24-53).

TABLE 2. Changes in students' life-world during studying

	Life stages during studying		
	First study year	Third study year	Fifth study year
Basic characteristics of life stage and determinants of life	-adjustment to changes -'caught' in between home and university town	-involvement in studying and human relations -search for own life style and time for experimenting	-orientation outwards from university -creating a family and transition to work
Personal and social identity	-becoming independent and less reliant on parents -confusion and learning of new things	-conscientious working and free experiments -frustration	-calming down; time of maturing -forming own world view
Life situation and its main components	-housing problems -getting used to managing money affairs -best friends in home town -learning a new freer way of life	-life in dorms -shortage of money -forming pair bonds -studies determine life rhythm -summer jobs and training jobs	-desire to move out of dormitories -fear of impending poverty trap -reassessing human relations -work plays an increasing role
Study situation and its main components	-getting used to new ways of studying -attending introductory mass lectures and compulsory general courses -giving up school-like ways of studying -tutorial groups	-whole-time studying -strong affiliation with own department and its staff -regular scheduled course work	-writing a thesis -finishing minor subject studies -final structure of degree -own department no longer a center of interest -seminar groups
Main features of study processes	-formation of a set pattern of study -focus on facts and details -mastery of wholes difficult -university appears 'fascinating'	-personal study style -relativeness of knowledge -critical attitude to science -cue seeking -loss of glamor in studying	-independent study at own place -build-up of scientific viewpoints -reassessment of the relevance of science -wrapping up of studying and transition to work

When students who were at different stages in their studies were compared, it was discovered that problems encountered during the period of studying were linked with life's changes. Those students who were in the early stage of their studies brought up in interviews a variety of problems related to leaving the home environment, gaining more independence and starting a life on their own, but this period was also

often seen as a beginning of a new life, full of promise. Those who were getting close to finishing their studies stressed the forming of a family, getting employment, and problems related to personal finances. Those in the mid-course of their studies appeared to be almost entirely involved in studying and student life, which often seemed to produce anomic feelings of alienation (Aittola 1986, 24-53).

Students felt quite free to choose their own life styles, but problems were created by the social and economic uncertainty of their position, which might lead to social marginality and living on the borderline of minimum existence. It was characteristic of students' life situation that the more students' meals, housing, travel, or other aspects of life were subsidised by society, the more they had to submit to official control and tutelage. The vision portrayed by Habermas (1981, 182-276) of the controlling system of modern society, which penetrates into people's life-world, also applies to the present social and economic situation of students. For instance, the recently expanded study support system which is based mainly on loans, introduced a variety of control regulations that are related to minimum progress made in studying, to the students' own and their parents' economic situation, and to their marital status. Most interviewees mentioned that they found it easiest to adapt themselves to ready-made norms or study schedules, nor did they want to make independent choices, which was an expression of a more general mode of acting on the basis of learned helplessness: you find the life easiest, if you do not attempt more than is required (see Aittola & Aittola 1985, 147-181; Aittola 1986, 61-67).

4.1. *Students' life situation*

The term students' life situation is used to refer to all those factors that provide the context for the daily studying. Life situation includes various kinds of ideal and real elements through which students encounter the world around them (Heidegger 1980, 299-301; Schutz 1975, 116-132). Students' life situation was largely defined by living in student dormitories, where some features of student sub-culture were developed which had to do with the provisional housing arrangements and the irregularity of life style. Students' financial position deteriorates with the

passage of time of not to speak of the poverty trap looming ahead: despite the fact that the government study support was enough to get by during the early stages of studying, students were compelled to find ways of earning extra money towards the end of their studies (Aittola & Aittola 1985, 100-113; Aittola 1986, 28, 38, 47).

Problems and pressures which emerged during the period of university studies, were usually resolved by resorting to fellow-students for help. It was thus customary for students to discuss among themselves the various problems they encountered in studying, human relationships and student life. Many interviewees told us that enduring friendship ties helped them to cope. This method of dealing with problems may, however, lead to excessive psychologization and individualization of the problems (see Broady 1985, 9-21). Social problems related to student status and student life tend to become converted to individual shortcomings or failings caused by the personalities of individual students. (Aittola & Aittola 1985, 113-118; Aittola 1986, 64.)

Studying defined students' life style very globally, since even students' time awareness is built around seminar papers, end-of-term examinations, and lectures. Almost all of the interviewed students had given up a normal weekly or monthly life rhythm, because studying required a certain temporal disjointness vis-a-vis the non-campus world and life (cf. Bourdieu & Passeron 1979, 29-32). Most of the interviewees did not regard the time organization based on studying as any problem, but accepted it as a self- vident, study-related requirement, which they were willing to put up with, in exchange of a freer way of life (Aittola & Aittola 1985, 118-123; Aittola 1986, 23-53).

Present-day students do not have any distinctive uniform culture but they have several private sub-cultures. Many of the interviewed students told us that student culture is most clearly manifested in their life style, rather than in any particular cultural interests (cf. Bourdieu 1985, 142-151). Students' sub-cultures have been privatised into a variety of self-contained sub-groups which were formed on the basis of e.g., sport and physical exercise, subject-matter based clubs and organizations, freetime interests, religious activities or friendship ties (Aittola & Aittola 1985, 119-124; Aittola 1986, 56-60).

Students accepted their life situation as well as their study situation as more or less given and unproblematic and d'd not dwell on

them particularly, unless some problem forced them to pay special attention to them. Rapidly emerging crises were, however, typical of students' life situation on account of problems related to financial situation, human relations or studies. In spite of this, many students did not want to increase their own influence on their life situation, since the time of studying was felt only as a temporary state of existence (Aittola & Aittola 1986, 61-67). Students did not complain of even major handicaps, because, in their opinion, being a student presupposed an acceptance of having to do without many pleasures and adjusting to limitations. The greatest problems were felt to be the financial insecurity due to studying and the various control measures related to obtaining the government study support. But, on the other hand, life during student days is not saddled with the same requirements and criteria as apply to working age-mates - studying functioned as a sort of illusion of freedom in comparison to the obligations inherent in salaried work. (Bourdieu & Passeron 1979, 28-32.)

4.2. *Study situation and university milieu*

The position and the functions of the university have changed recently because the rapid expansion of the university institution and its becoming a modern mass university has diminished its function as the guardian of classical civilization in relation to its function of modern professional education, as Löwenthal (1975, 75-77) has noted in his analyses of the university. Universities are faced with conflicting expectations, which are also reflected in research, teaching and learning. The university milieu and study situation are increasingly dominated by various bureaucratic factors that have to do with the organization of studying, study programs and the hidden curriculum of the university. (See Parjanen 1983, 3-35.)

Although some students of small departments described the social climate of their departments as free and student-friendly, most departments are felt to be bureaucratic places, where the students are just anonymous faces among the large student mass. Many students were so strongly attached to their departments and student communities that they seemed to build their identities, or what Bourdieu (1985, 142-151) calls habitus, on the basis of their study program. Students' strong

identification with their own year group alone has led to the discarding of several study and student life traditions and to the carrying over to the university of high school characteristics. At the same time it has divided students quite clearly into two groups: those who value economic capital and can be said to represent the yuppie culture with its emphasis on career development consisting of students of economics, computer studies and data processing and some natural sciences, and on the other hand, those who represent the cultural and social capital and belong to the alternative culture of social sciences, humanistic sciences, and educational sciences. (Aittola 1986, 30-31, 39-41, 49-51.)

Students were relatively satisfied with the official study program and with the teaching they had received, although they were externally controlled and allowed too few choices. But not all students considered external control of studying as a negative thing, since particularly first year students and students in clearly professional study programs had a strong intention to finish the required course work as quickly as possible and did not set other objectives for studying. In more theoretically oriented study programs the situation was almost reversed, because the students engaged in them wanted to enjoy free academic life style and student and university culture, in addition to getting a degree. The relationship between external control of studying and students' approach to studies was illustrated by the fact that the students associated with the class teacher program, which was the tightest and most externally controlled study program, used more often a surface approach than those students who were engaged in freer study programs. Finding studying meaningful seemed to presuppose a relatively free study program, which allowed students to choose study units from the official study requirements. (Aittola & Aittola 1985, 147-181; Aittola 1986, 54-56.)

There appeared to be a considerable need for study guidance in all student groups. The need for study guidance is explained by the fact that students in the new study programs are used to getting almost everything ready-made (cf. Aittola & Aittola 1985, 147-181). The wishes concerning the content of guidance reflected the problems that students meet at different stages of their studies: at the beginning the students wanted to have information on the options they had, concerning areas of concentration, and towards the end of university studies the wishes had to do with master's thesis guidance. It was somewhat surprising to

discover that guidance was most frequently required by students in the mid-course of their studies, who needed guidance particularly in carrying out seminar and project assignments (Aittola 1986, 24-53).

4.3. *Study process and scientific thinking*

The greatest changes and problems during the process of studying occur towards the middle and end periods of studies when students have to change their mode of studying from the consumer role in which they take small course examinations into that of the producer of knowledge required in the writing of essays and carrying out seminar assignments. Students explained that the difficulty of seminar assignments and the master's thesis was due to the fact that they now had to decide independently what topic to choose and how to deal with it (Aittola 1986, 64-66). Adapting to the external control of studying was found to be one of the main aspects of the hidden curriculum of the university. It is further illustrated by the fact that doing well in studying actually requires students to seek cues related to examinations, adjusting to authorities and control measures related to studying and holding back one's own opinions (Aittola & Aittola 1985, 148-154, 195-205; Snyder 1971, 146-200).

In their approach to studying most students applied deep processing and tried to understand what they read, instead of rote learning. A change of approach to studying in this direction became necessary because of the extensiveness of the subject matter to be covered. Most students varied their study strategies according to the subject matter, although students in the social sciences applied holistic approaches more often than students in economics, data processing and teacher education, who often resorted to atomistic approaches to information processing. As far as the depth of information processing is concerned, no clear relationships were found since students were found to use both surface and deep processing in all study programs (see Aittola & Aittola 1985, 195-205; Marton et al. 1981, 49-78; Entwistle & Ramsden 1983, 6-83).

Different study strategies were associated with different knowledge interests and with the different goals set for studying. Economics students and teacher education students had a more instrumental orientation to studying than students of social sciences and psychology, for whom

university studies meant scientific self-development by means of the studied subjects. Study interests that stressed theoretical understanding and self-development generally led to deep processing of knowledge, probably due to intrinsic study motivation. Extrinsic achievement motivation, based on the desire to take a degree, was generally found to lead to more superficial study strategies and to greater cue awareness and aspirations to please the examiners (Aittola & Aittola 1985, 182-205; Aittola 1986, 66).

The development of scientific thinking by means of the studied subjects is one of the main goals of university studies. The developent of students' scientific thinking followed quite closely Perry s discussion of this topic (Perry 1970, 57-200; 1981, 76-109) which is illustrated by Figure 2 below.

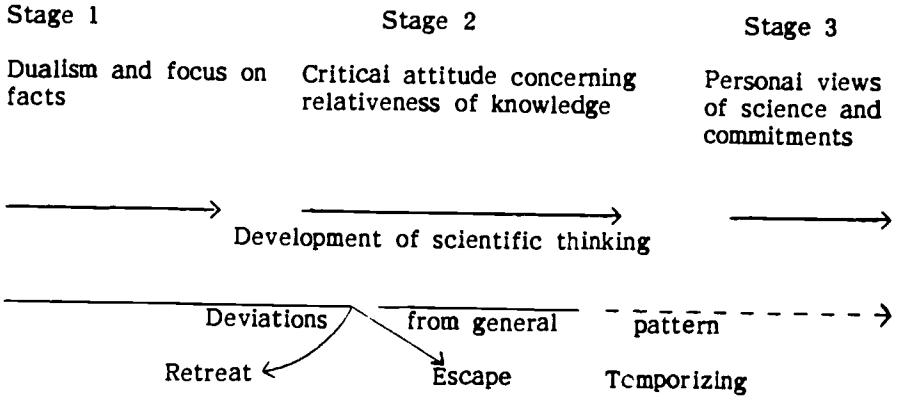

FIGURE 2. Stages in the development of scientific thinking

The early stages of studying were characterised by a fact-oriented mode of thinking with accompanying general appreciation of science, which was transformed during the middle of the study program into a relativistic mode of thinking with accompanying critical attitude towards science and theories. It was only towards the end of their studies that students were able to start forming a personal view of science. Going through these three stages generally took five years. Although required course work can be accomplished in a shorter period of time, it takes

longer to internalize the subject matter. An in-depth processing of the studied subjects required that students had an opportunity to apply what they had learned in their thesis work and to reflect on them over time. It should however, be noted that not all interviewed students had progressed to stage three. It was not considered even necessary by achievement-oriented students in the fields of data processing and economics, by language majors, and class teacher candidates, all of whom wanted to concentrate on the learning of the technical skills needed in their future jobs. Those who had reached the furthermost stages of scientific thinking were found among students of psychology, sociology and education. They also had a more theoretical and academic orientation to studying and experienced university studying as more meaningful than did students in teacher education and economics (Aittola & Aittola 1985, 188-193; Aittola 1986, 24-53).

5. Conclusion

An interdisciplinary study of how university studying is experienced by students showed that university studies form a very dominant and significant stage in students' lives. Lived meaningfulness of studying was best predicted by students' study interests. These determined the fact that theoretically oriented students experienced university studies as more meaningful than those students who had a more purely professional orientation to studying. Students' life situation and study situation had to be sufficiently satisfactory to enable a successful completion of this life stage. Meaningful and successful studying also presupposed that students had enough opportunities of choice and influence concerning decisions related to their own lives and study processes.

Changes in students' scientific thinking and life stages during the period of studying reflected changes in their more general life values. Most students indicated that they had achieved a more open mind and become more mature during studying, because general changes of life that took place during that time period had forced them to develop various coping strategies vis-a-vis the problems encountered. Most of the students

we interviewed emphasized that they had learned at least as much from their student life and their life in the university milieu. Sandford (1981, xvii) has aptly noted that it is not appropriate to look at university study processes and studying period only from the perspective of effective scientific and professional training, as if those were the only purposes of university studies. Most students set many other goals on their university study processes and student life, which may be equally important and meanigful as the officially stated objectives.

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Orientations to learning and the study environment

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The article seeks to identify student types that differ in terms of their orientation to learning and their perception of the study environment. The data was collected at the University of Jyväskylä in 1986 by means of questionnaires developed by Entwistle (Entwistle & Ramsden 1983). Using cluster analysis, students were classified into four groups with regard to orientation to learning and into three groups with regard to their perception of the study environment. Students' orientation to learning reflected either a surface approach, a deep approach, extrinsic motivation or defensive orientation. The study environment was perceived either as positive, negative or vocationally relevant. The article further examines the interrelationships of these groups and the association between the groups and different degree programmes.

1. Introduction

The article examines the relationship between orientation to learning and the study environment and the way this relationship varies in different degree programmes. The data was collected by means of Finnish versions of two questionnaires developed by Entwistle (Entwistle & Ramsden 1983), i.e. The Approaches to Studying Inventory and The Course Perceptions Questionnaire. The reason for choosing these measuring instruments was, on the one hand, that there was already information available on their qualities and, on the other hand, that it was possible to use comparative data from both international and national research - different Finnish versions of the same questionnaire have been used in Finland e.g. in the studies of Ropo (1984) and Puurula (1986).

Entwistle and Ramsden's point of departure was a fundamental notion, which is in itself trivial, but easily forgotten in university teaching and which at least earlier has received little attention in

research. i.e. that the sole purpose of teaching is to facilitate learning and that learning is done by the student. This realization led to the discussion of the essence of learning and especially the studying-learning process. The main purpose of Entwistle and Ramsden's research programme was, in fact, to investigate students' approaches to learning and to determine to what extent these approaches reflect the effects of teaching and assessment demands, and to what extent they mirror stable characteristics of individual learners.

Since earlier studies had shown that the relatively stable psychological characteristics of students were only to a minor extent associated with the level of academic achievement, attention was focused on the investigation of processes, contexts and the academic environment. The model of styles and approaches to learning depicted below (Figure 1) acted as a theoretical foundation for the final version of The Approaches to Studying Inventory. The purpose of the developed model was to clarify the distinction between a deep/surface approach and comprehension/operation learning. The model also distinguishes two stages of both comprehension and operation learning.

At the same time as students' approaches to learning were examined, a survey was also carried out on students' perceptions of their departments. The reason for this was that the curriculum (what is to be taught and learnt), pedagogy (how what is to be learnt is transmitted) and assessment (what is regarded as valid realization of knowledge on the part of the learner) are factors that have the greatest influence on learning in the academic environment.

The most stable difference found in research literature between study methods is the one existing between the departments of the humanities, social sciences and natural sciences. The explanations offered include variation in the organization of teaching, course characteristics and assessment. Entwistle and Ramsden also found it interesting that clue-conscious students were aware that the study strategies they used - although yielding good results - had a fatal effect on real learning.

By using The Course Perceptions Questionnaire it was possible to describe certain dimensions, such as standard of teaching, workload and clarity of goals. The weaknesses of the questionnaire were also clearly revealed: it does not take into consideration the attitudes of individual students toward individual courses or teachers.

Approach or Style	Process		Outcome
	Stage I	Stage II	
Deep approach/ versatile	All four processes below used appropriately to reach understanding		Deep level of understanding
Comprehension learning	Building overal descripton of content area	Reorganizing incoming information to relate to previous knowledge or experience and establishing personal meaning	Incomplete understanding attributable to globetrotting
Operation learning	Detailed attention to evidence and steps in the argument	Relating evidence to conclusion and maintaining a critical, objective stance	Incomplete understanding attributable to improvidence
Surface approach	Memorization	Overlearning	Surface level of understanding

FIGURE 1. A model of styles and approaches to learning (Entwistle & Ramsden 1983, 42)

The analyses of results aimed to describe to what extent the differences in students' approaches and the perception of study contexts could be explained by type of subject studied and by type of department, when the subject area studied was controlled. Factor analysis was used to identify relationships between the two measuring instruments. The outcome was that reproducing orientation was related to a heavy workload, and disorganized study methods and negative attitudes to studying were related to lack of clear goals. Furthermore, good teaching, freedom in learning, openness toward students and social c.. ..ate were related to intrinsic motivation and use of evidence in studying, while clear goals and vocational orientation were related to extrinsic motivation. (Entwistle & Ramsden 1983, 184.)

The methods used in the above mentioned research studies by Ropo (1984) and Puurula (1986) included factor analysis to identify orientations to studying. The interpretations lent support to the findings of Entwistle & Ramsden (1983). However, factor analysis is based on *variables* and their common cha..acteristics; the results might have been different if the starting point of the analysis had been the *student* as in the present research programme.

The research problems of the present study are as follows: 1) What types of learning orientations and perceptions of the study environment can be identified? 2) What is the relationship between orientation types and types of environment perception? 3) How are the different types distributed in the degree programmes? 4) Is the relationship between orientation and perception of the environment the same in different degree programmes?

2. Data and methods of analysis

The research data was collected at the University of Jyväskylä in 1986. Originally, the research study included 434 students from the degree programmes of educational administration, planning and research, business economics, national economics, physics, chemistry, music education and music therapy, hydrobiology, and philosophy. Degree programmes were

deliberately chosen which were as different as possible and which had not been explored much in earlier research programmes. The study phase was identified by asking which year the university studies had been started. This variable was, however, not included in the analyses presented here.

Since the project wanted to retain the student as an active individual in analyses, cluster analysis (Clustan-programme; Wishart 1978), which starts from the unit of observation, in this case the university student, was chosen as the method of analysis. The method compares students with each other and combines units into bigger groups. The point of departure is the indices of the geometric distances of the units. The aim is to find groups with maximum internal homogeneity, which differ from each other as much as possible. It is an explorative method which seeks to find a grouping solution best describing the data.

As the method of analysis does not allow missing information, some of the data were discarded. The remaining data included 388 students. Cluster analysis was carried out separately on sum variables describing orientation to learning and on sum variables describing the study environment. Sum variables were formed in the same way as in Entwistle and Ramsden's research programme. Each sum variable consisted of 3-6 propositions describing the approach or the perception of the study environment in question.

3. Clusters of learning orientation and study environment

From the point of view of statistical mathematics it would have been best to use two clusters in the analyses concerning both orientation to learning and the perception of the study environment. However, the dispersions in the groups would then have approached the dispersion of the whole set of data and the means would have been fairly close to each other. Also in terms of interpretation, the only remaining difference would have been the difference of level. For this reason, it was decided that four learning orientation clusters and three study environment clusters be used.

Table 1 shows a clustering solution based on four types of learning orientation. The groups have been interpreted as primarily describing either a surface approach, a deep approach, extrinsic motivation or defensive orientation to learning.

TABLE 1. Clusters of learning orientation

Sum variable	Surface approach		Deep approach		Extrinsic motivation		Defensive		Whole set of data	
	mean	s	mean	s	mean	s	mean	s	mean	s
1. Deep approach	10	2.4	12	2.1	10	2.1	10	2.0	10	2.4
2. Relating ideas	8	2.1	9	2.2	8	1.7	9	1.9	8	2.0
3. Use of evidence	11	2.5	13	2.1	11	2.3	11	2.6	11	2.5
4. Intrinsic motivation	10	2.8	14	2.3	11	2.5	12	2.6	12	3.0
5. Surface approach	21	2.6	16	2.4	18	2.2	17	2.5	18	3.1
6. Syllabus-boundness	8	1.7	6	1.6	8	1.8	6	1.7	7	1.9
7. Fear of failure	12	1.5	10	2.2	10	2.3	11	1.9	11	2.2
8. Extrinsic motivation	15	2.7	11	3.0	15	2.6	10	2.4	13	3.5
9. Strategic approach	10	2.1	10	2.3	10	2.0	9	1.8	10	2.2
10. Disorganized study methods	16	2.6	9	2.4	12	3.0	14	2.8	12	3.7
11. Negative attitudes to studying	16	2.2	11	2.7	12	2.5	15	2.2	14	3.2
12. Achievement motivation	14	2.6	13	2.6	14	2.4	11	2.5	13	2.8
13. Comprehension learning	12	2.4	12	2.3	10	2.2	12	2.2	11	2.4
14. Globe-trotting	14	2.0	12	2.1	12	2.3	13	1.8	13	2.3
15. Operation learning	13	2.3	11	2.1	13	2.2	11	2.1	12	2.3
16. Improvidence	14	1.9	12	1.9	12	2.0	12	2.0	13	2.2
Student total	94		103		88		103		388	

It was characteristic of the students in the first cluster that their approach was the most superficial and their study methods the least organized. Furthermore, they had the most negative attitudes to studying and the weakest intrinsic motivation. Since, however, extrinsic motivation in the group was on an average high, the group can be regarded as rather problematic from the point of view of university studies: it clearly lacks to a large extent the study skills traditionally associated with readiness for university studies.

Students in the second cluster were characterized by a deep approach, use of evidence and intrinsic motivation. They had least often unorganized study methods and negative study attitudes. Students belonging to this group probably largely correspond to the image of an "ideal student".

Students in the third cluster were extrinsicly motivated and they had least inclination to comprehension learning, but they did not have a negative attitude to studying. The aim of this group would seem to be to graduate. Students belonging to this group probably adjust easily to the university, which values efficiency highly.

The fourth group had the lowest extrinsic as well as achievement motivation. Furthermore, they had almost as negative study attitudes as students in the first cluster. On the other hand, the level of intrinsic motivation in this group was second highest after the group with a deep approach. It is as if the student type characterized by this cluster does not dare to study seriously and is pedagogically maybe even more problematic than the superficial student of the first cluster. This inference is supported by the fact that when clustering, the combining of groups, is continued, it is this group that is last distinguished from the rest of the research subjects. In orientation to studying, motivation problems are thus maybe more essential than the surface/deep approach to the subject matter to be studied.

A similar analysis was also carried out on sum variables describing the study environment. The variables were based on students' views on their own study environment (Table 2, p. 48).

TABLE 2. Study environment clusters

Sum variable	Perception of the study environment: Negative mean	s	Positive mean	s	Vocational relevance mean	s	Whole set of data mean	s
1. Formal teaching methods	15	2.4	15	2.6	18	2.3	16	2.6
2. Clear goals and standards	14	2.8	17	3.0	18	2.2	16	3.2
3. Workload	17	3.0	13	3.4	16	2.8	16	3.4
4. Vocational relevance	13	2.9	16	3.3	18	2.4	15	3.5
5. Good teaching	13	2.5	18	2.3	15	2.5	14	3.2
6. Freedom in learning	14	2.9	20	2.7	16	2.7	15	3.5
7. Openness toward students	14	2.6	19	2.2	16	2.2	16	3.1
8. Social climate	13	2.4	15	3.0	14	2.5	14	2.8
Student total	178		72		138		388	

The environment of the students in the first cluster lacked clear goals. Its vocational relevance was lowest, teaching weakest, freedom in learning lowest and openness of staff towards students was most limited. The workload was heaviest and social climate poorest, although the means of these variables did not deviate very much from the means of the other groups.

The students in the second cluster had the lightest workload, best teaching, most freedom in learning, and the openness of staff towards the students was greatest.

In the third cluster the goals and standards were clearest, teaching most formal and the courses had the highest vocational relevance. In terms of the other variables, the group was situated between the first two.

According to the results, a considerable proportion of students perceive their study environment in a rather negative way. And of those, who perceive their study environment as having clear goals and vocational relevance - students in clusters two and three - only students placed in the second and smallest cluster perceive the study climate as clearly positive. Do these results mean that pedagogical factors have less significance for a student than the connections between the contents to be learnt and the goals after studies? Is it so that, if one can not perceive one's studies as goal-directed, also vocationally, pedagogics has no chance - as for students in the first cluster? Or is it that only a small proportion of students are so closely committed to "scientific interest" - students in the second cluster? - that the pedagogical climate can have any greater significance for them?

Next, attention will be focused on the way orientations to learning and the study environments are associated with each other. Since the aim was to retain the student as the focal point when moving from types of learning orientation to types of study environment perceptions, the above clusters were crosstabulated.

TABLE 3. Relationship between clusters of learning orientation and clusters of study environment

	Perception of the study environment			
Orientation to learning	Negative	Positive	Vocational relevance	Total
	n	n	n	n
Surface approach	51	13	30	94
Deep approach	37	27	39	103
Extrinsic motivation	29	23	36	88
Defensive	61	9	33	103
Total	178	72	138	388

Crosstabulation (Table 3, p. 49) shows that a negative perception of the environment is related to learning orientations characterized by a surface approach or defensive orientation. In an environment perceived in this way learning orientations characterized by a deep approach or extrinsic motivation were less frequent. A positive perception of the environment is less frequently related to defensive orientation and more often to a deep approach and extrinsic motivation. Perceiving the environment as vocationally relevant is not very clearly related to any particular orientation to learning.

It seems that the environment can be perceived as both positive and negative for different reasons. The fulfilment of study expectations as well as the phase of studies - which is not examined here - probably influence the way the environment is perceived.

4. Orientations to learning and study environments in different degree programmes

The research study of Entwistle and Ramsden sought to identify differences between disciplines: natural sciences, social sciences, humanities. A discipline may, however, encompass departments that are very different from each other. Hence, the relationship of degree programmes to learning orientations and to perceptions of the study environment is examined below. The smallest degree programmes mentioned earlier (p. 44) are not included in these analyses.

Table 4 shows that among students of education the proportion of those with a surface approach was above average and the proportion of those with defensive orientation was below average. Both degree programmes of economics and management had more than an average number of students with a deep approach and defensive orientation. Fewer of them were extrinsicly motivated. In biology, the proportion of students with extrinsic motivation was above average and that of students with a deep approacn below average. In the degree programme of physics the proportion of defensive students was below average, while students with extrinsic motivation and a deep approach were overrepresented. In the

TABLE 4. Relationship between orientations to learning and degree programmes

	Orientation to learning				
	Surface approach	Deep approach	Extrinsic motivation	Defensive	Total
Degree programme	%	%	%	%	n
Education	36	21	25	18	114
Business economics	22	33	15	30	73
National economics	20	32	15	32	65
Biology	22	11	44	22	18
Physics	22	33	28	17	46
Chemistry	10	27	19	44	62
Total	24	27	22	27	378

degree programme of chemistry, students with a surface approach were underrepresented, while defensive orientation was most frequent. Students of degree programmes representing the Faculty of Social Sciences resembled each other a great deal in their orientation to learning. In the Faculty of Mathematics and Natural Sciences the differences between the degree programmes were clearly discernible. This would seem to suggest that a faculty is not a unit of sufficient accuracy when the relationship between orientations to learning and academic contexts are explored, but that study cultures are organized according to department.

A fairly similar picture was obtained when the perception of the study environment was examined by degree programme (Table 5, p. 52).

TABLE 5. Relationship between study environment and degree programme

	Perception of study environment			
Degree programme	Negative %	Positive %	Vocational relevance %	Total n
Education	28	18	54	114
Business economics	60	22	18	73
National economics	46	28	26	65
Biology	28	17	56	18
Physics	48	15	15	46
Chemistry	69	11	19	62
Total	47	19	34	378

Students of education and biology regarded their study environment most often as vocationally relevant. The environment was experienced most negatively by students in the degree programmes of chemistry and business economics and most positively by students in the degree programme of national economics. As can be seen, also in this table the differences between the degree programmes of the Faculty of Mathematics and Natural Sciences are clearly manifested.

5. Discussion of results

The degree programmes differed from each other clearly both in terms of the students' orientation to learning and in terms of the students' perceptions of the study environment. Earlier research studies have discovered a relationship between a surface approach and extrinsic motivation, and between a deep approach and intrinsic motivation. In the present research programme these dimensions are organized in a somewhat different way. The reason may lie in the dissimilarity of the method used.

While Entwistle and Ramsden used factor analysis and sought to identify relationships between variables, the present research study has tried to identify student groups that are as homogeneous as possible, and factors that the students have in common. Student types are no longer as organized and logical as in earlier research studies. Neither does a similarly perceived study environment necessarily "produce" a similar orientation to learning in all degree programmes. The relationship between orientation to learning and the study environment is problematic in that it may vary in different phases of studies. Applications to universities are directed by students' images of them and whether expectations come true or not influences the way things are perceived. To determine these relationships would require that the study phase be included in the variables analysed.

The results of the research study raise a number of further questions. Why are studies in education and biology perceived as vocationally relevant, but not in the other degree programmes under investigation? Why is the study environment that is perceived as vocationally relevant in the degree programme of biology associated with an orientation to learning which emphasizes extrinsic motivation, while in the degree programme of education it is associated with a surface approach? What does it mean when degree programmes that have most students with a deep approach are most frequently perceived as negative study environments (physics, economics)? The extent to which these perceptions arise from the official teaching culture of the departments (curriculum, pedagogy, assessment) and from the hidden curriculum and the extent to which they are associated with the relative popularity and dropout tendency in the different fields are questions which require further investigation. The fact that students in the degree programme of chemistry perceive their environment in rather negative terms and at the same time have a mostly defensive orientation to studying, is both logical and understandable: in Finland the field has not been very popular and often not the students' first choice.

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PART III

Notes on the concept of knowledge - from the perspective of epistemic representations, higher education and work

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The concept of epistemic representations is introduced to make conceptual distinctions in the discussion concerning the conceptions of knowledge of university educated people. The term epistemic representations refers to anyon 's implicit or explicit "theories" of knowledge, and it does not exclude personal or social dimensions of the phenomena. Epistemic assumptions as defined and measured in the Reflective Judgment Model of Kitchener and King are seen as one dimension of these representations. Preliminary results concerning the epistemic assumptions of university students and people with higher education who have already been employed for ten years are presented in the article. The stages of the epistemic assumptions are measured with the aid of the dilemmas of Kitchener and King, and the subjects (n=41) represent the fields of medical, technical and social sciences. In the medical and technical field the students scored lower than the employed. These differences were not statistically significant, but they were in the same direction as previous results. The relationship was reversed and nearly significant in the field of social sciences. Possible reasons for this unexpected result in this field are changes in the motivational structures or changes in the learning and teaching methods. Students in social sciences scored nearly significantly higher than the engineering students, and the medical students scored between these two groups, which was in accordance with the hypothesis. These Finnish results did not differ in any striking way from the results of some other countries, but still they rise the question whether the development of epistemic assumptions gets enough stimulation in higher education.

1. The aims of this article

The aims of this article are twofold. On one hand it tries to enrich the discussion about "conceptions of knowledge and their development" by introducing the concept of epistemic representations. On the other hand, it presents some preliminary results concerning the epistemic assumptions of university students and people with higher education who have already been employed for ten years. The empirical data are part of a larger project, in which the epistemic representations and notions of experts are studied with subjects representing a variety of fields and educational levels. The results presented are comparable to some studies done in other countries.

2. Epistemic representations: what are they and why to use the concept?

The concept of epistemic representations is defined in this study as anyone's implicit or explicit "theories" of knowledge. They can have the form and content of for example well articulated theories - or even be like "real" philosophical theories - or they can exist as attitudes or dispositions without justification. Epistemic representations are, however, many-sided phenomena and they are always loaded with values and feelings. The development of different facets of epistemic representations can be connected to various promoting factors, and the study of these representations demands the use of many different kinds of methods. If these "theories" are part of socially shared reality, they can according to S. Moscovici's (e.g. 1981) studies and terminology be called social representations.

The classic in the field of epistemic representations is the work of William Perry (1968). He studied - using his own terminology - the intellectual and ethical development of high school students. Perry's model is based on the interviews of Harvard students, mainly men. The development is seen as proceeding from egocentric absolutism to contextual relativism and further to commitments in relativity. Perry

describes nine developmental positions. The lower positions describe an increasing complexity of decision making, a decreasing dependency on authorities, and a diversification of the conceptions of knowledge. The main theme in the positions from six to nine is the development of responsibility when committing oneself for example to vocational choices or marriage.

Some studies in this field have also been done in Finland. Järvinen (1985) compared in her doctoral dissertation her results to Perry's model, and asked "why is it so, that many medical students apparently do not reach the third cognitive stage?" With this third stage she means the stage in which personal scientific viewpoints are formed. Järvinen tries to find the answer in the stages of development of professional orientation. She has also later (e.g. 1987) discussed the special problems relating to professional higher education, and underlined that professionalistic learning by model contradicts the central goals of higher education because it hinders the formation of personally constructed scientific viewpoints and the development of a professional personality.

In her dissertation Järvinen (1985) divided the medical students' answers to the question of characteristics of scientific research into three categories: external circumstances, methods, and internal criteria of scientific knowledge. In the population descriptions one person could be rated as belonging to more than one category, but when analysing changes each person was rated as belonging to the "highest" attained category (the categories were previously listed in their rank order). The reasons for Järvinen's decision are easy to understand. As the list of examples of external circumstances include, however, such items as economic, administrative and political criteria, motives, and multiplicity of values, the question arises whether these answers really reflected more external orientation to science than understanding of the social nature of science. Perhaps these persons, for one reason or other, just did not bother to include, for example, reflections about the internal criteria of scientific knowledge in their answers. The data were gathered with questionnaires, and usually it is quite difficult to make distinctions like these without interviews. As the raters, however, know the answers as no one else can know them, there is no reason to suspect their conclusions. The point remaining is: how do the medical students relate to the social construction of science, and how is this connected to other dimensions of social representations?

Aittola (1986) has concluded in his study concerning advanced undergraduate students from various faculties that most of the subjects had reached the stage of making personal synthesis in scientific thinking. This even though many students said that they were more critical towards science, or scientific truths, than before. In an earlier study, however, Aittola and Aittola (1984) concluded, referring to Perry (1968), that the subjects of various majors seemed to proceed by very different paces, and that not everybody reached the highest stage. Nuutinen (1985), who has studied the development of scientific world view, has raised the question about how many university students should in our opinion develop a view about scientific knowledge as hypothetical constructs. She doesn't give any answer to this question, she only states that nowadays less than half of the biology and psychology students develop such a view during the first three years of higher education. Noteworthy in Nuutinen's work is also that all the examples she presents, also the more developed ones, are more or less context specific.

Besides having been a reference point for more or less loose comparisons, Perry's (1968) model has also served as a starting point for further theorizing. King and Kitchener (e.g. Kitchener and King 1981; King et al. 1983) have tried to find an answer to the question whether there is any development in the assumptions of knowledge after Perry's fifth position. According to them Perry's model didn't answer this because the development in the highest positions concerned identity. These researchers developed a seven stage model of epistemic assumptions and their justification, and called it the Reflective Judgment Model. In this model development proceeds through qualitative changes from absolutism to relativism and further to integrative evaluation. The changes are not abrupt, and development does not necessarily proceed in absolute syncrony. The model has got empirical support among other things from a longitudinal study (King et al. 1983). Table 1 provides some examples of the stages of the model.

TABLE 1. Some examples of the Reflective Judgment Model.
(Adapted from King, Kitchener and Wood, 1985)

Stage	How certain is knowledge	How is knowledge gained	How are beliefs justified
1	absolutely certain and immediately available	by direct observation	beliefs are a direct reflection of reality, no need to justfy them
4	no certainty because of situational variables (i.e. data lost over time)	via our own and other's biases. data, and logic	via idiosyncratic evaluations of evidence and unevaluated beliefs
7	certainty, some knowledge claims are better or more complete than others, although they are open to revaluation	via process of critical inquiry or synthesis	as more or less reasonable conjectures about reality based on an integration and evaluation of data, evidence and/ or opinion

In order to study the reflectivity of the judgments Kitchener and King have developed a special interview method. It consists of four dilemmas concerning various fields of life, semi-structured probes and scoring instructions. The method is quite structured even though the interview proceeds on the basis of the answers of the subjects. The main point in scoring is to find the basic organizing principles of the answers. Even though the method is in no strong contradiction with the qualitative methods connected to the other studies presented in this article, it has certain distinctive features: when subjects are trying to find answers to some real contradictions and justifying their views, it can be hypothesized that they are using such mental constructions that may otherwise be

reached with difficulty or not at all. Subjects' epistemic assumptions can find concrete manifestations in their reasoning even though it may be that some of them are not able to verbalize them as such. The assumptions of knowledge revealed by the method of Kitchener and King are, however, only some dimensions of epistemic representations - even though they may be regarded as very important ones. The personal and social dimensions of knowledge are for the most part missing from the model, which is in accordance with the premises of the model. Still, the model is explicitly non-fixed in its highest stage to any concept of truth.

By using the concept of epistemic representation it is possible to both widen our view of knowledge, and make our conceptual distinctions clearer. This widening means for example taking into account subjects' values and views of the future. One example of the results of the analysis of concepts was presented previously in connection with Järvinen's work. Nuutinen's classification of conceptions of knowledge provide another possible example. Her classes were: appreciative, technical, end state related, utility demanding and hypothetical. It seems reasonable to look at these classes also as more independent dimensions.

The third reason for using the concept of epistemic representation is that it doesn't exclude such matters as for example power and ideals. It can aiso function as a bridge between larger scale societal practices and individual lives. Both Nuutinen and Järvinen have been interested in, and worried about, the conceptions of knowledge that the students of higher education develop at the moment. The empirical results that will be presented next are part of a research project concerning epistemic representations and notions of experts. The empirical data in the project is not restricted to the level of higher education, but the results in this article will be.

3. Empirical results of epistemic assumptions

The presented empirical resul are preliminary and restricted in many ways: they are based on a san f higher educational level subjects of the study in which subjects of other educational levels made about two

thirds of the whole sample. The interviews lasted usually four or five hours, and they were done during 1986-1988. The dimensions of epistemic representations analysed in this article are the assumptions of knowledge and the justifications of these assumptions. These results are based on two of the four dilemmas of King and Kitchener presented to all subjects.

The dilemmas concerned the objectivity of news reporting and the building of pyramids. After the subject had taken her/his stand on the basic contradiction the interview proceeded with semistructured probes. Each separate protocol was given three scores reflecting the epistemic stages present. The ratings can all be the same as well as different. Two scorers rated the protocols after having reached over 80 % within stage interrater agreement. All protocols were rated blindly, which means that the scorer didn't know even the educational level of the subject.

Also, the sample of the subjects for this study was randomly chosen. The subjects were persons who had graduated ten years ago from various educational institutions in the metropolitan Helsinki area and students who were about in the middle of their studies at these institutions. The included professions were: M. A. (Pol. & Soc. Sci), physician and M. Sc. (Engineering). The subjects were always selected randomly from lists of all possible subjects. If the person was currently living outside metropolitan Helsinki s/he was excluded from the study.

The starting point for the next analysis were the results according to which higher education usually promotes epistemic development (see previous chapter). It may also be expected that the work experiences of many or at least some academic persons can possibly promote the cognitive-structural development in general (Basseches 1986). The results and ideas concerning the possible differences of students of various majors have been somewhat contradictory. For example Welfel (1979) did not find any differences in the assumptions of students of liberal arts and engineering, but the efficiency of the data analysis has later been questioned. Kitchener's (1977) dissertation includes various pieces of information that speak for the differences among diverse majors. Also Järvinen (e.g. 1985, 1987) has clearly indicated the problems of development in professional fields at the time of the study. Wilson (1981), however, after having discussed the learning tasks in the arts and sciences concludes with stressing the basic common features of various fields. On the basis of previous analyses it could be expected that if

there would be any group differences in the present study, the employed would score higher than the students and subjects from engineering and medical fields lower than subjects from the faculty of social sciences.

The means and standard deviations of the mean epistemic stage scores are presented in Table 2. All three scores for each dilemma have equal weight in these calculations.

TABLE 2. Means and standard deviations of the mean epistemic stage scores

	Field		
	Social sciences	Medical	Technical
Students			
x	5.9ac	4.8	4.3d
s	1.1	1.3	.9
n	6	8	6
Employed			
x	4.8b	5.3	4.6
s	.8	1.2	.6
n	8	7	6

a,b & c,d $p<.05$

In the medical and technical field the students scored lower than the employed. The students were at the middle of their studies so it can be expected that also their studies have at least some challenges for development still left. These differences were not statistically significant, but they can be seen to be in the same direction as previous results (e.g. Perry 1968; King et al. 1983; Aittola 1986). It should, however, also be noted, that the regional mobility of various professions varies much. In order to be able to at least contact five employed male physicians we had to check 27 names and addresses - 16 of them had moved to other

parts of Finland. The comparable numbers for male social scientists were six and none. It may be expected that physicians interested in research work more probably stay in metropolitan Helsinki than others. Also the differences among various student groups can be seen to be in the same direction as the results of previous studies (e.g. Aittola & Aittola 1984; Kitchener 1977). There was, however, an unexpected difference in the results concerning students and employed persons in the social sciences: the students scored clearly higher than the employed. One reason for this might be regression of the same kind that Järvinen (1985) discussed to happen among medical students. Nothing in the information concerning the work experiences of these subjects gave hints in this direction. A simpler explanation might be that there have been some other, field specific cohort effects. In the whole sample the epistemic scores didn't correlate with school achievement or success in matriculation examination. From Table 3 it can, however, be seen that the mean grades of matriculation examination have been poorer among the persons who graduated ten years ago from the faculty of social sciences than among the other groups. This specialty of the group might be connected to the unexpected result. It might be, for example, that the tightening of the admission requirements to the faculty of social and political sciences is reflected also in the motivational structures of the students. It is also possible that the change in learning methods from examinations based on many books to more active learning and teaching methods has stimulated the development of epistemic assumptions in this field.

TABLE 3. Mean grades in matriculation examination (1=lowest, 5=highest)

	Field		
	Social sciences	Medical	Technical
Students	4.5d	4.5	4.7
Employed	3.0ac	4.7b	4.2d

ab $p<.01$, cd $p<.05$

The subjects also answered questions concerning their present work - with a special emphasis on the question of self direction in work (see e.g. Kohn 1969). No clear connection could be found between work experience and epistemic level, and one reason for this may be the small number of subjects, the other the small variation in the answers to many questions (for example the supervision and communication with the boss, if one had such). Among the variables with greater deviations was the time needed to finish something in one's work. The times varied from five minutes to five years, but no connection to epistemic stage scores could be established. One single interesting phenomenon in the data could be found: the three highest scorers told that they worked at least half of their time in a group. Of the others, five indicated that they worked independently, seven that they worked less than half of their time in a group and four that they worked at least half of their time in a group. This finding may, however, be accidental, and if it is not, we still do not know how much it is a question of seeing things differently, and even after this - what's the possible causal direction.

Especially from the viewpoint of higher education and learning the information about other aspects of the epistemic stage scores will be of interest. Information concerning the highest stage that each subject reached is presented in Table 4.

TABLE 4. The highest stages reached. The numbers indicate the number of subjects in each cell.

	Students			Employed		
	Social sciences	Medical	Technical	Social sciences	Medical	Technical
Highest stage reached						
7	5	3	2	2	5	2
6	-	1	-	1	-	1
5	1	2	1	5	2	3
lower	-	2	3	-	-	-

On the basis of these results it might be recommended, that in the future questions concerning the nature of knowledge and the justification of knowledge claims should have a more prominent part in the curriculum of students of certain fields. The justification of a situation where it's possible that a university educated person will not be able to do anything more than to solve context specific problems presented to her/him is highly questionable.

According to King's and her colleagues (1983) study the mean stage scores of beginning and graduate students in liberal arts were 3.8 and 6.0-6.3. The results from Germany were (various majors): beginning students 4.7, advanced level 4.6 and graduate students 5.3 (Kitchener and Wood, 1987). Comparing these to the results of the present study it can at least be said that there does not seem to be anything special in the epistemic assumptions of Finns compared to comparable persons from other pluralistic cultures.

The preliminary analysis based on all subject groups of this study have clearly showed that the more highly developed one is, the more difficult it is to find factors that are connected to development (Pirttilä-Backman 1987). Also the difficulty to find connections between various dimensions of one's work and epistemic stages in the present article clearly indicate that the understanding and explanation of development demand more idiosyncratic and molar approaches than analysis based on single variables or combinations of some variables.

According to Dr. Kitchener's request I hereby indicate that neither the interviewers, nor the scorers were certified ones.

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University didactics and the learning of scientific thinking

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The article deals with the relation between university didactics and learning. Of special interest are the kinds of didactical principles presupposed by the teaching and learning of scientific creativity. The starting points of developing didactics are searched in the field of creative scientific research. According to the article the basic problem lies in the fact that often in instruction we rely on the logic of presenting research results instead of the logic of producing new scientific knowledge. The article presents as an example a teaching experiment of a university course of chemistry.

1. Introduction

A relatively unified system of teaching methods and forms, which is differentiated by each field of science, has developed in Finnish university didactics. Scientific knowledge is transmitted through lectures, alongside which and as a substitute for which there is a fairly great amount of information acquired by independent study by the students themselves. As an integral element in the acquisition of scientific knowledge are the evaluation and control of the level of knowledge. Different examinations and control tasks constitute a part of the methods used in university instruction. From a didactic point of view an examination and preparing for it is even at present perhaps the most essential means of creating learning situations. The mastery of newly acquired information is crystallized in knowledge demonstrated in examinations and in passing tests. Counting test scores and study weeks supplements the contribution of examinations.

Beside the acquisition and learning of scientific knowledge, university studies aim at introducing scientific thinking and the scientific method. Lectures and the acquisition of scientific information are expected for their part to develop these qualities in the students. The realization of these goals has been planned as the specific task of seminars. The classical prototype of seminar work is typically argumentation and dialogue where well-founded viewpoints are presented in favour or against some point of view. The didactic principle in seminar work is the idea that scientific research is continuous search where one has to be able to present grounds for any expressed statements and weigh the scientific significance of the viewpoints presented.

University study programmes and examinations include teaching methods whose didactic function is the application of the scientific knowledge, methods and thinking intended for acquisition. The seminar papers, theses and practice included in the various phases of study aim at least partly at promoting the application of scientific knowledge and thinking in independent work. The second objective of the practice period is to provide a realistic picture of the possible professional tasks. The learning of essential skills as well as applying theoretical knowledge are aimed at during practicum courses.

The challenge to the didactic development of teaching is to direct learning so that students would be capable of scientific creativity and develop theoretical concepts. It is usual to think that scientific creativity and the development of theoretical concepts do not belong to the study phase. These cannot be required until the stage when professional research is being carried out. This claim is, however, based on a faulty conception of creativity. According to it, the phase of creative activity is preceded by the phase of acquiring different existing concepts in which creativity does not play any role. Scientific creativity is not taught, either, it is learnt. This explanation lacks an answer to the question why an acquisition phase is necessary in the development of scientific creativity. How does old existing scientific knowledge induce new theoretical concepts?

The study of relationships between theoretical concepts and reality from the point of view of creativity sets new demands on the didactic planning of instruction and raises new problems. The relation between instruction and the development of a field of science must be re-

examined. Instruction cannot be implemented as a separate thing. It must be closely combined with research and development in the field. The basic precondition for the improvement of the qualitative level of learning is that instruction is coherently connected with the development of theoretical concepts in the field of science (cf. Hakkarainen 1986).

Defining the relation between theoretical concepts and praxis as objects of study means emphasizing knowledge of techniques and methodology. Positivistically understood knowledge of methods is out of the question here, but rather functional knowledge aiming at change similar to the notion of paradigm by Kuhn (1962). The requirement might seem exorbitant in two respects. The "paradigmatic" development of science in different fields is at different stages and it might not have been sufficiently studied. The development of a field of science seems to depend on social factors outside its sphere. Conscious mastery of methods and an active outlook on development are, however, a precondition to conscious learning. Knowledge of methods and going through the origins of the theoretical concept connected with it is an essential characteristic in the theory of learning activities (Davydov 1972; Davydov et al. 1982; Davydov 1986).

The formation of methodological consciousness is not possible without a genetic-historical approach. Methodological consciousness cannot be built on nothing without history. The genetic-historical approach does not mean a mere description of events. In the study and production of development, three types of historical analyses are needed: history of theory and methodology, earlier development history of the object, and history of the phenomenological level (cf. Engestrom 1987, 323). The holistic construction of the object of study presupposes all these analyses.

It seems that the production of new scientific knowledge, new theoretical concepts are connected with a new kind of learning, which has been referred to by the concept of learning by expanding (Engeström 1987). The basic difference is that we advance from the traditional acquisition and internalization of knowledge to the problematics of producing new knowledge. Which characteristics are essential in a learning process aiming at the production of new knowledge? This kind of learning is by nature collective activity. Its connection with the development of a field of science takes place through the solving of contradictions of different levels. In learning situations these conflicts are represented by

"double binds". Learning by expanding in a certain field of science presupposes both general and specific methodological solutions.

University didactics is confronted with a serious dilemma by the concept of learning by expanding. Traditional didactics loses its secure basis when an attempt is made to diminish the borderline between instruction and research. Traditional university instruction aims at acquiring research skills, but learning by expanding makes extra demands, since creating something new is assumed. On the other hand, learning by expanding as a new form of the historical development of learning is developing especially in scientific research. The problem is to transfer it to scientific instruction and structuring instruction according to its demands. What would the relation between instruction and research be like then? How would the content and methods of instruction change? What would the didactic principles of instruction be like?

The previously outlined thoughts on the connection between instruction and learning do not attempt to discount the difference between the logic of presenting research results and the logic of producing research results. The realization of the starting point of the outline implies a distinct change of priorities. The didactics of traditional university instruction has started from the logic of presenting research results. Now suggestions are made to transfer the priority area of didactics into the logic of producing research results. Creative production in scientific research serves as a model for the outline of didactics. In the following units some starting points for the development of university didactics are presented. Concrete didactic solutions have to be searched, as in subject didactics, from the problems and content of each field of science.

2. The development of creative scientific thinking

2.1. *The subject of scientific research and learning*

In the traditional didactics of university instruction, learning is examined as a phenomenon on the individual level. In lectures, group work and seminar work activity takes place with a student group and a whole group is taught, but the group is not the subject of learning. Instruction is generally geared to an "average student's" possibility to assimilate knowledge. The object of instruction is an abstract individual. The control and evaluation of assimilation usually takes place on the level of individual learning. The use of group work is not generally related to the criteria of learning (Hakkarainen 1984).

The specific characteristic of scientific research and other professional work is advanced collaboration and division of work. Also scientific creativity is based on the activity of a sientific community. Individual talent and scientific creativity is a result of a relatively late historical development. Scientific community precede it and is also its background. An individual thinker and a creative scientist are not a unit of scholarly work. Making new scientific findings or implementing research ventures aiming at practical applications are at present decisively the problem of organizing the subject of scientific research. Engeström (1987) has demonstrated, with the help of some examples, how in the beginning of this century we have switched over from earlier scientific research "presupposing individual creativity" to mass production of scientific knowledge.

The activity of the scientific community, the formation of the modern subject of scientific research is fairly tamely represented in the didactic planning and implementation of university instruction. With a little good will some traces of this could be seen e.g. in seminar work. But such essential characteristics as searching for in principle new scientific findings, planned cooperation, reciprocity, common setting of goals and formation of motives are deficient. Still, the problem of creating a collective subject for scientific research was topical already in the development of classical Greek science.

The school of Socrates was the first representative of creative pedagogy. The school aimed at guiding persons towards finding new knowledge (heuristics) instead of transmitting existing knowledge and culture. The relation between teacher and student changed radically. The teacher does not "endow" the recipient with knowledge, but attempts to arrange collective reasoning, which aims at producing new knowledge in collaboration. The student transforms from the role of a recipient of knowledge and ideas into their producer. Even though the situation is taken care according to a programme designed by the teacher, it aims at producing something new. The new knowledge is not known beforehand by the person supervising work, either. The new knowledge is discovered due to the intellectual endeavours of those partaking in the dialogue. From the point of view of the formation of the subject of scientific research the teacher's task is to organize collective intellectual creativity (Jaroshevski 1979).

Doing scholarly work is social activity, but the entire society is not its subject. The scientific community concentrates on doing scientific work, it has its own language, norms and rules for the mastery of the objects to be studied and the dealings between the community members. Individual researchers join the scientific community through a special functional entity, which can be called microsocium (Jaroshewski 1979) or microcosm (Engeström 1987). This constitutes a collective that is somewhat different from the one formed from the scientific community as a whole. The collective subject of scientific activity is formed from a hierarchical social structure, which proceeds from the generally social through the micro and macro levels of science to the personality of an individual scientist. Scientific creativity could be a synthesis of achievement at different levels (Jaroshevski 1979).

In the scientific community and in immediate active interaction in the microcosm there always prevails to some extent a division of role and work. For example, in research concerning natural history, different kinds of equipment are needed as well as experiments carried out with them, whose technical implementation presupposes specialized personnel. On the other, hand producers of new theoretical hypotheses and new theories are needed, but also those who criticize the newly produced ideas and hypotheses. The producer of new ideas is not very often able to construct experimental designs, and a good critic is not necessarily always able to

come up with alternative new ideas. A consciously organized functioning microsocium or microcosm, where the preconceived division of work is realized, may create something new. It can also bring into the limelight individuals, whose individual characteristics and creativity seem to be the key factors in the production of something new.

It is evidently rare that producing something new on the level of activity is embodied in an individual researcher. Most often the creator of something new is an organization, a group of researchers carrying out different functions, a collective subject. A collective subject aiming at creating something new does not very often coincide with an organization of official scientific research e.g. on an institution level. A collective subject is not the same as hierarchy: head, departmental head, senior researcher, junior researcher, ... archer, assistant. Creative scientific activity presupposes another kind of social interaction. Producing new theoretical ideas assumes another kind of reciprocity than that of administrative hierarchy.

The reason why it is so difficult to notice in science anything else but separate researchers and their creativity, is to a great extent a result of the fact that we examine knowledge, which has been crystallized and accumulated in science. This knowledge does not directly reveal the scientific activity or the whole subject of activity that is behind the results. Behind the scientific knowledge presented as a final outcome of research are left collaborative relationships, division of work, the preceding phases leading to the output, the motives for research etc. The active aspect of scientific research must be analyzed separately from the outcomes. In the analysis of the active aspect, the reconstruction of the subject of research activity or its organization plays a very significant role.

The subject of scientific activity does not necessarily have to reside in natural individuals that are blood and flesh here and now. Lektorsky (1984) presents an example where the temporal dimension of the subject of scientific research is hundreds of years. When the collective subject is a concept describing a cultural phenomenon, it can reach over the centuries, in case scientific dialogue between the representatives of different eras is possible. In culture, text can replace physical presence. This kind of formation of the subject in scientific activity has been noticed e.g. in Galileo Galilei's scientific creativity (Rozin 1981).

Thrashing out ideas in a dialogue form with Plato, Archimedes, Orem and Aristotle had a decisive effect on the shaping of the principles of combining scientific material. In scientific communication there are also present representatives of other eras and cultures, even though they are not physically present (Bibler 1975).

The teaching and learning of scientific thinking and creativity in the university may remain a mere illusion, in case we by pass the probematics of scientific activity and its integral part, organization of the subject of activity, in didactics and the planning of instruction. As the example of Galilei indicates, what is essential in the organization of the subject is what the subject's activity really is and how it is implemented. The problem concerning the subject cannot be reduced e.g. into the problem of using group work in university instruction. The question is not only organizing the social relationships of students and dividing certain roles to the members of the group. The problem of the subject in scientific research activity and learning is closely connected with other elements within the totality of activities and cannot be solved separate from them.

Organizing scientific research activity and the subject of learning corresponding to it is by nature a different task than developing the organization, even though from the outside the tasks may seem almost identical. In the development of the organization, a survey of social problems is emphasized as well as a search for common solutions. Main emphasis lies in the analysis of social relationships and communicat' . The problems are seen as problems of social contacts between individuals who are by nature independent. The qualitative improvement of contacts by open discussion and general considerations of the problems is a central tool for the development of the organization.

The starting point of the subject of scientific research is different. When scientific creativity is the goal, surpassing the old and producing something new is the crucial problem. The subject is organized to solve this problem. Improving the social atmosphere or undoing the knots in the communication between individuals is not sufficient. Common collective instruments for thought are necessary, with the help of which the problem can be solved. The common tools for collective thinking do not presuppose simultaneous presence in the same location. The task of creating a collective subject is possible to perceive as a challenge for reintegrating the culture of thinking. Expressed in the form of a general principle, the

logic of changing a common objective must be changed into the logic of work division between individual members of the collective subject.

2.2. *Instruments of creative scientific thinking and activity*

Scientific research includes a lot of other activity than mere creative thinking and development of its tools. One function of science is to collect and store scientific knowledge. But from the point of view of developing university didactics, a current and interesting question is how new means of thinking are produced in scientific research and how scientific creativity depends on the tools of thinking. The analysis of the tools of creative scientific thinking should serve the conceptualization of the didactics of university instruction.

The organization of the collective subject of scientific research is already a basic precondition and tool for the development of creative thinking. When the collective subject is examined as a tool of creative thinking, its most important quality is included in scientific thinking on the individual level as well. In every argument we should consider possible counter arguments and the study of topics from another viewpoint. The dialogue aspect of scientific thinking is evidently easier to implement as a real dialogue of the collective subject or as complex argumentation. The dialogue and argumentation between individual subjects is genetically an earlier form of dialogue than the internal dialogue of an individual subject. Improving the qualitative level of dialogue and argumentation may require return to an earlier developmental phase

The examination of scientific thinking easily emphasizes existing categories and concepts, and the dialogism included in them remains unseen. When the categories and concepts have been crystallized, they do not as such directly reveal the contradiction that has existed behind the selection. The formation of the categories may be considered even an automatic or intuitive process, if we do not consciously analyze the internal contradictions in it. Bakhtin (1963) considers Dostojevski's skill of simultaneously making parallels and contrasts his special merit. "Even the inner conflicts and developmental phases of a single person he dramatizes in their environment, makes his hero talk with his double, with the devil, with his own alter ego, with his caricature. Dostojevski

attempts to turn every inner conflict of a person into two persons in order to dramatize the conflict and to reveal it." (p. 124)

A similar methodical approach can be found in Galilei's dialogues concerning the scientific method. A new type of theoretization came true in the examination of two experimental processes so that the persons taking part in the dialogue and debate represent different viewpoints. Dialogues are a series of thought experiments, which simultaneously explore the possibility of transforming Aristotelean logic into Copernican. Thought experiments with an idealized object follow Socratean pattern: you do not know that you already know, but we shall uncover your knowledge, we shall restate it logically. The thought experiments that Galileo carried out in his dialogues are not disconnected but form a whole of carefully worked-out acts (Blumberg 1981).

In order to understand dialogue and scientific thinking it is necessary to make a distinction between external and inner speech. In external speech, several logical moves that form the core of the argument are left to be read between the lines, since they are taken to be self-evident. In inner speech, many moves are dropped which would be needed in external dialogue with other people but which are not required by the person concerned as arguments for truth. If this logical structure of inner speech is not taken into account, it is not possible to make the other person convinced of the defensibility of arguments. For this reason, penetration into inner speech, into the syntx of 'omissions' and the 'montage' of inner speech can reveal the actual mode of thinking. For these reasons, Galilei used living Italian in his dialogues instead of Latin (Bibler 1975).

A large part of scientific debate and dialogue is concerned with the boundaries of categories and concepts. In search of boundaries, scientists are less worried about the core of categories and of their prototypical exemplars than about what cases are included in and what excluded from the category concerned. From the point of view of creative scientific thinking, however, of greater interest it the kind of dialogue that seeks to shift the core of the category and redefine the nature of the phenomenon in a new way. Such an attempt to redefine the nature of the problem is exemplified by the anarchistic definition of stealing: removing property without permission is not stealing; stealing consists of legal possession of property (Billig 1967).

Defining the nature of phenomena in a new way presupposes that knowledge becomes the object of a specific kind of activity. This is contingent on "the state of ideal existence". The first ideal object was probably created by the Pythagorean school out of the concept of number. Previously number functioned as the instrument for solving a variety of practical tasks (eg., measuring grain) and served practical needs. Now number became a basic component of world view. The mythical status of number led to a study of what number best corresponded with the ideal. The best exponents of the ideal were found in the interrelationships between numbers. Thus ideal objects came to constitute essential elements of world view (Gaidenko 1980).

The mythical stage of theoretical consciousness meant the decoupling of knowledge from the solution of immediate practical problems and the constitution of science as a separate special form of activity. Science as mental production, as the production of knowledge was possible in ancient culture only in connection with a worldview model of reality, which defined man's relation with the world and his position within it. Subsequently the development of science and of scientific thinking was dependent especially on the development and differentiation of culture (Gerasimov 1985).

One might think that the experimental method of the modern era destroys the linkage with myths and with the development of culture and constitutes a direct continuation of everyday practical observations. The experimental method does not, however, imply the expansion of common sense observations and their generalization. The qualitative difference between scientific knowledge produced through the experimental method and common sense observation lies in the fact that to supplement common sense observation is created scientific empirical reality in which common sense observations have been elaborated by means of concepts and hypotheses. From the facts of common sense observations we can construct a variety of competing scientific facts whose verisimilitude has to be assessed within a broader context. Thus a scientific fact lies within science but its material is determined outside of scientific thinking (Svyrev 1984).

In the development of scientific thinking from the Galilean time onwards, the empirical was emphasized as the domain through which new material enters science. Scientific thinking faces the task of integrating

the empirical and the theoretical into one whole picture, whose components are the immediately perceivable empirical reality and a deeper empirical reality. All this presupposes that scientific research and thinking is seen as activity, whose central characteristic is a conscious relationship with the means and conditions of activity (Svyrev 1984).

What are those means and conditions of scientific research that university students should be taught to have a conscious relationship with and whose use would reveal shifts in the nature of phenomena? Modeling is an essential instrument of thinking through which it is possible to create a conscious reflexive relationship with the use of the means of activity. However, this presupposes that the use of models displays a Gallileian methodological shift. In other words, no matter how accurately a model is used to describe an object, this does not in itself create a reflexive relationship. It is only when the real object under investigation is linked with modeling that a basis is created for the development of thought. For the first time in Galilei's work, modeling was associated with the experimental change in the studied object, whereas previously the efforts focussed simply on making the descriptive model of the object more accurate. It is important to be able to distinguish the ideal element from the real object by relating it to the theory and, on the otherhand, it must be possible to transform the real object into the ideal state by technical means (Rozin 1981).

In his dissertation, Engeström (1987) provides an interesting discussion of the role and significance of modeling in theoretical thinking. The constitution of the object has been distinguished in theoretical thinking as the first step. The construction and modeling of the object seeks to bring out and make visible the relationships and regularities underlying the immediately observable behavior of the object. The first stage in theoretical thinking has been described in the following way:

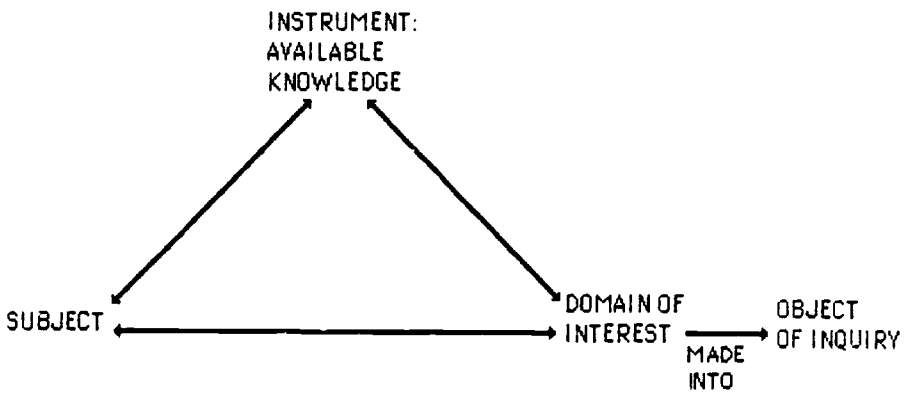

FIGURE 1. Object constitution as the first step of theoretical thinking (Engeström 1987, 253)

The clue of scientific thinking is often found by reconstructing the problems and tasks that have been the starting point for theory development. The real problems are not necessarily those that have originally been stated in the beginning, since problems tend to shift and change as research progresses. Researchers themselves often cannot monitor and register such changes. For this reason, when scientific thinking and research is analyzed, it is important to find out what questions and problems were actually pursued through research (Grjazorov 1982).

A conscious visible model can be constructed using experimentation, analogies, imagination, etc. For instance, in constructing models of mechanics, Galilei used models of thought employed in astronomy and combined different previous models of motion. Engeström has illustrated the conscious construction of such models as follows:

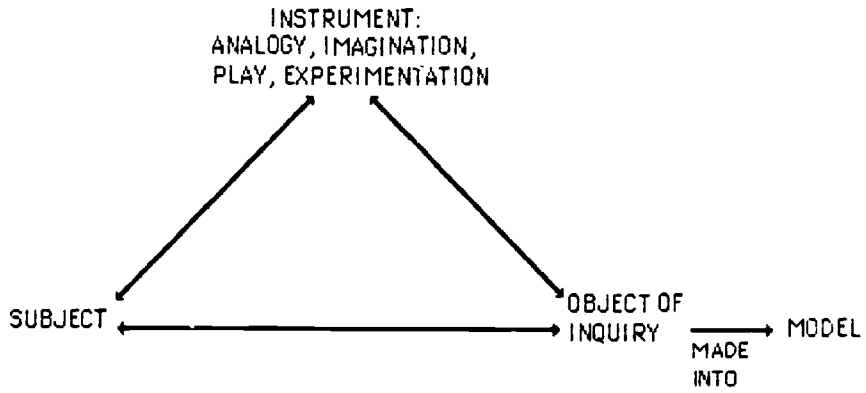

FIGURE 2. Model construction as the second step of theoretical thinking (Engeström 1987, 254)

The model is not only used to modify the object but also to develop it further. The model is used for theory construction. Theory is the actively developing relationship between the model and the reality it purports to describe. This third step in the development of theoretical thinking has been described in the following manner:

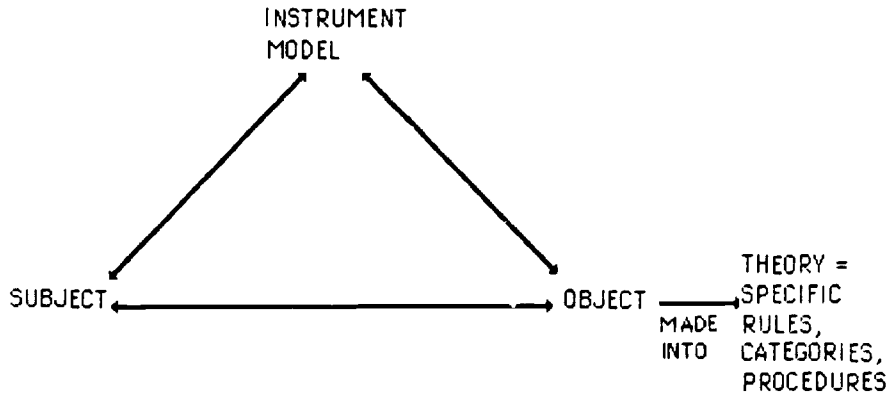

FIGURE 3. Ascending to the concrete as the third step of theoretical thinking (Engeström 1987, 255)

The function of models in theoretical thinking has been described in the foregoing discussion on the level of mental actions. The challenge of using models is a qualitative shift from the individual into modeling the activity of the collective subject of scientific research. This challenge has been described as follows:

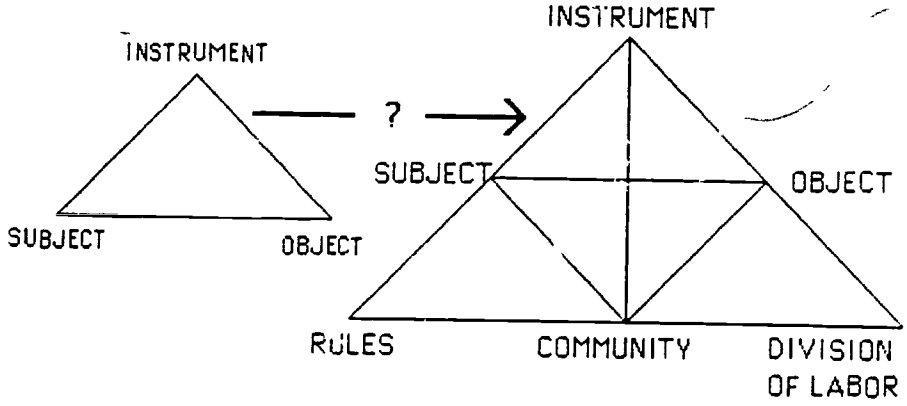

FIGURE 4. Transition from individual actions to collective activity (Engeström 1987, 256)

Engeström (1987) explains the shift from individual actions to collective scientific research activity drawing on historical cases and on the qualitative ruptures involved in them. Traditional analysis of creative scientific thinking generally stops at the stage where an individual appears to come up with an idea. This kind of analysis of creativity misses expansive development, since this occurs at a collective level outside the realm of individual creativity. Such an approach is ill suited to the analysis of industrialized research since it neglects the internal conflicts of research activity. In order to understand change in scientific activity, we have to analyze such internal contradictions which the development of qualitatively new ideas seeks to respond to.

Engeström (1987) has reconstructed the internal contradictions derived from Mendeleev's research on the periodic system of elements, drawing on Kedrov's historical-functional analysis:

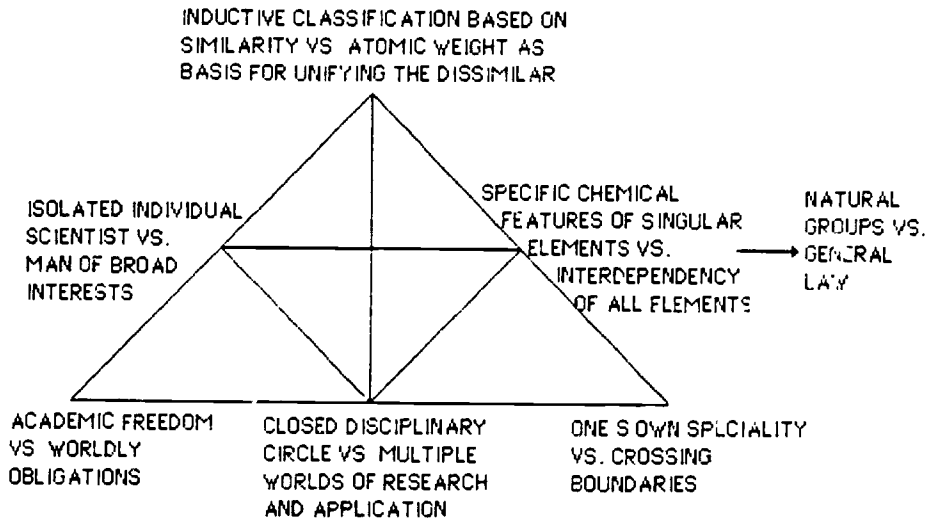

FIGURE 5. The primary contradiction of Mendeleev's chemical research activcity (Engeström 1987, 260)

Accounting for Medeleev's scientific research within a broader functional framework brings forth a new dimension of creativity, which is significant for teaching scientific thinking. If solving internal contradictions of researc. explains the development of scientific thinking, then it is possible to achieve a shift from the individual to the collective level of research by means of different secondary instruments. Engeström's (1987) historical analysis explains expansive shifts through three kinds of secondary instruments: springboards, instrumental and social models or microcosms. Springboard is defined as follows: "The springboard is a facilitative image, technique or socio-conversational constellation (or a combination of these) misplaced or transplanted from some previous context into a new, expansively transitional activity context during an acute conflict of a double bind character. The springboard has typically only a tempo ary or situational function in the solution of the double bind". (p. 287)

Engeström's historical cases cite as springboards the technique of lying (Twain's Huckleberry Finn), image of tar making (Aleksis Kivi's Finnish classic "Seven Brothers"), image and technique of playing

patience, and the socio-conversational constellation of atomic scientists (the Manhattan Project). Huckleberry Finn's general model of action was "after this always do whichever comes handiest at the time". The model of the seven brothers of the Impivaara household was highly-developed agricultural cultivation. Mendeleev's model was crystallized as the law of periodicity and as the table of elements. The general models of the Manhattan Project dealt with the physical theory of the splitting of the nucleus, the optimal bomb and "superlaboratory" Microcosm is a minitiature community on which a new form of activity is built. A microcosm consisted of the people on the Mississippi raft, the Impivaara farm house, and of Dr Oppenheimer, General Groves and the two colonels who travelled together on the train.

Defining scientific thinking by the concept of activity and linking creativity with historical changes offers a possibility of looking at the didactics of higher education and learning in college from a new point of view.

3. Didactic problems in teaching scientific thinking

Focussing pyschological research on the processes of learning and on students' conceptions of different phenomena has brought about a change also in the didactics of higher education. It is possible to get an idea of the effectiveness of higher education by studying students' learning strategies or styles and the conceptions constructed on the basis of them. It can, for intance, be shown that students' views of the nature of scientific knowledge vary from one discipline to another, and that studying does not make students' conceptions of scientific knowledge more uniform (Dahlgren et al. 1981, Entwistle et al. 1983, Nuutinen 1985).

Taking into account learning strategies in teaching means that there is due emphasis on clear, structured bodies of knowledge in the content of teaching and in learning. Fragmented pieces of knowledge are replaced by knowledge of wholes, by the ability to distinguish between the essential and the non-essential and to derive details from general principles. However, learning is examined mainly as the interaction

between the text and the learner, but not as an activity that would bring about something new in theory and in practice.

The study of learning strategies and of students' conceptions has not, however, at least so far, led to development work in the didactics of higher education which would aim at producing new didactic principles or radical changes in the linkage between teaching and learning. For instance, Entwistle and Ramsden (1983) warn: "we should not try to change a student's learning style, except as a last resort when it is creating serious difficulties for the student. On the other hand it is valuable to help students to become more aware of their characteristic style and approach, to show how they may most effectively capitalize on their intellectual strengths and at the same time transcend the limitations of a particular style" (p. 206).

The study of learning strategies has been carried out in connection with a variety of texts (Marton et al. 1977, Vauras-von Wright 1981). The concept of learning strategy has not included the perspective of the scientific or theoretical status of the studied information. Divorced from the study of learning strategies, researchers have investigated what conceptions students have of scientific knowledge, learning, etc. The connection between strategies and conceptions may have been studied also using the correlative methodology. Any kind of perspective of the whole situation has sufficed to indicate an attempt to go "beyond" the text. Little or no attention has been given to the criteria or levels of conceptualizing different wholes. A dichotomous distinction has been considered sufficient, or detecting parts of the whole texts has been built as an intermediary link. A conscious attempt to change learning through the content of teaching has been fairly rare. In this respect, the attempt to develop the didactics of higher education on the basis of Galperin's theory of learning is an interesting case (Salmina et al. 1984, Sokolovskaja & Talyzina 1983).

The starting point of the development work was the observation that 60% of chemistry students in university were not able to give reasons for the progression of studies and for its logic. The investigation compared three principles in organizing chemistry instruction at university level: traditional, structural-functional and genetic (what factors cause the chemical features of substances). The planning of traditional instruction in chemistry did not reveal any clear scientific reason for the progression of

teaching. The various themes of courses are not linked by any coherent logic of presentation.

A unifying theoretical conceptualization of themes was achieved applying the structurel-functional or the genetic principle. The former emphasizes the systemic character in the teaching of chemistry: the object of research in chemistry is divided into levels, each of which can be described by means on some invariance. These provide for the stability of the system and for its justification. The functional connections constitute a system. Three levels were explored in teaching: subatomic, atomic, and molecular. The use of the genetic principle as the foundation of teaching means that at first attention is given to the substances and concepts that allow the system to develop (what gives rise to the chemical characteristics of substances).

The search for invariants started from a systemic examination of complex phenomena and from the basic concepts of systemic structural analysis. In the language of learning strategies, teaching guides students to discover features in the studied object, which is required by deep processing. In the first phase, the students get acquainted with the structural analysis of different systems. In the second phase, the multi-level structure of matter is revealed together with the specific characteristics of each level. In the third stage, students learn about the behavior of chemical systems: the progression and mechanisms of chemical reaction is defined from the point of view of chemical structure, thermodynamics, and kinetics, and chemical reactions in different conditions are studied. In the fourth stage, changes in elements and compounds are studied, and chemical analysis is introduced. The logic of progression is shown in Figure 6.

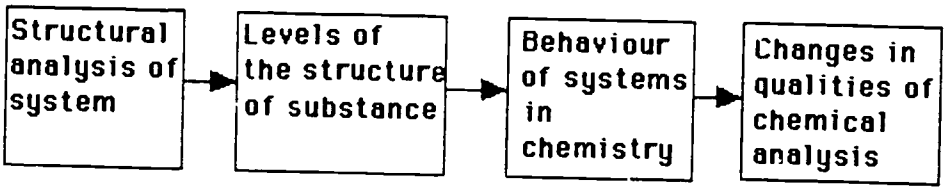

FIGURE 6. Search for invariances as the logic of progression in chemistry teaching

The progression of chemistry instruction and learning in search of invariances occurs by leaps and the criterion of forming the systemic whole is, in some sense, taken from outside. According to the logic of the described progression, the concept of general systemic structural analysis should constitute the thought instrument by which the subsequent stages are linked togther. Now the general systemic structure analysis is directly associated only with the first stage. Focussing attention on the levels of the chemical structure of matter and their invariants compartmentalizes knowledge instead of guiding attention to the shared basis of all chemical phenomena and the connections between different levels.

The other approach of the experiment focussed on the concept "electron in the atom", which formed the "germ-cell" of chemical characteristics of matter. It was possible to derive from this basic concept the periodic system of elements and further the chemical characteristics of matter and the foundations of chemical analysis. The logical structure of the course is presented in Figure 7.

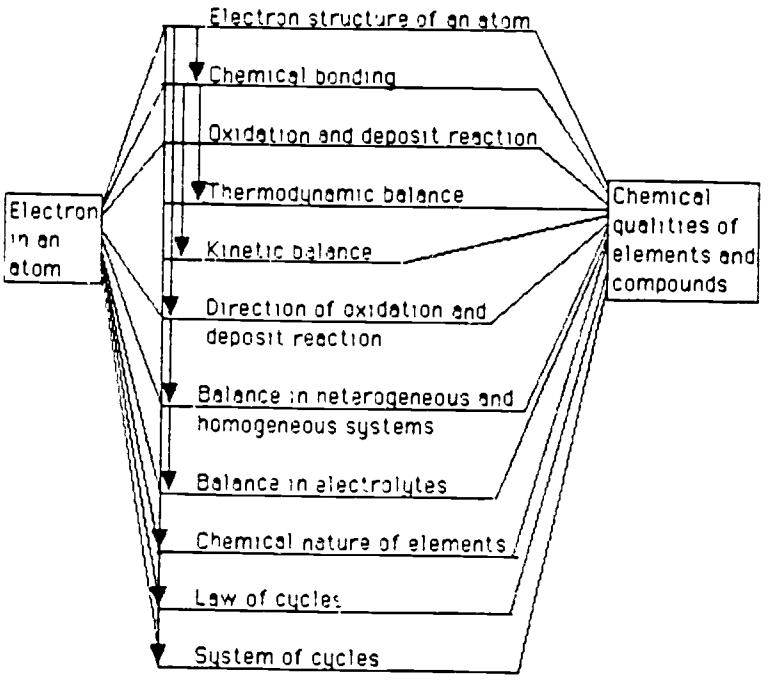

FIGURE 7. Logical structure of a general course in chemistry in a system of instruction that is based on the genetic principle (Salmina et al. 1984, 58)

A central question in assessing the alternatives of the experiments is: How do the various ways of systematizing content change learning? The systematization of content utilizing either invariants or the genetic basic realtionship presupposes that, in the stage of planning instruction, there is an effort to survey the historical development of the discipline and the earlier ways of teaching chemistry. This does not, however, automatically lead to a qualitative improvement of learning, since the logic of the content of the discipline has to be transformed during the learning process into a logic of thinking and activity.

The experiment based on Galperin's learning theory emphasizes the crucial role of learning orientation in comparison with the stages of the execution and control phases of learning. Besides, didactic planning only aims at the formation of learning acts. The totality of learning activity is not the starting point of didactic planning. This is shown, for instance, in that learning motivation is not included in didactic planning in the experiment discussed here.

In comparison to traditional instruction in higher education, this approach does change the totality of learning situations. Learning tasks and learning situations comprise a unified whole, which aims at learning the central points in the discipline. Teaching consists of lectures and practical applications, as before, but the content-wise integration links methods of work together. The most significant difference to earlier learning tasks is that orientation is fixed by means of cards, which outline the essential knowledge needed for solving the tasks. The purpose of the cards is, thus, to guarantee a correct and error-free performance. When the starting point was invariances, the orientation cards were received ready-made. In the other experimental group the students themselves derived some of the information included in the cards from the concept "electron in the atom".

The results of the experiment were assessed using as criteria the comprehensiveness, systematicity and justifiability of learned information. In traditional instruction, the solution of tasks and problems had been limited to the sphere of each theme concerned. It was difficult to see connections and apply the learned information beyond the "local" problems. In the experimental teaching, however, the comprehensiveness of knowledge was shown eg., in the ability to see comprehensive systemic characteristics and to realize that a more complete description requires

transferring from one level to another. Systematicity was seen in the ability to discern the hierarchical levels in the structure of matter and to apply the systemic method in the exploration of the form of organization in each substance. The justifiability of knowledge was shown in that students were able to demonstrate how the organization of each substance occurs at the preceding level of structure and characteristics.

Teaching the mastery of bodies of knowledge in such a way takes into account some characteristics of scientific thinking but neglects some other. Perhaps the most important point in this respect is that attention is focussed on knowledge structures and not on the totality of activity. Even if the content of instruction is derived historically, there is no study of the methods of knowledge formation over and above the viewpoint of the invariants of the levels of matter (or the pseudo-genetical principle). What has changed systemic thinking in the study of chemistry has not been considered. This kind of methodological knowlewdge is, however, essential in the development of scientific thinking. The importance of methodological knowledge in developing the whole of learning activity has been stressed, in particular, by V.V. Davydov (1977, 1988).

Although students were able to derive elements of the chemical analysis of matter from the concept "electron in the atom", this does not as such indicate a mastery of the totality of learning activity or creative scientific thinking. Bringing the level of activity into the instruction and learning of scientific thinking would presuppose answers to the following questions:

1. How is methodological reflection fostered in teaching?
   - How is the historical and methodological development reflected in the study content?
   - How is the definition and development of studied problems taught and learned?

2. How is scientific thinking made the object and instrument in teaching?
   - How can the structure of the two activities of research and learning be related to each other?
   - How can the internal contradictions of scientific thinking be made the object of learning?

- What kinds of shifts between empirical reality and theory are required by the formation of scientific facts?
- What is the role of modeling in thinking and what are other type acts in chemistry?

3. Subject of learning
   - If a scientific community or microcosm is the subject of scientific activity, what kind of subject of learning is presupposed by creative scientific thinking?

The experiment carried out on the basis of Galperin's theory of learning showed clearly that the development of teaching and learning is a scientific research task, not merely a planning task. It is not possible to develop the didactics of higher education by bringing in general didactic principles which are mechanically combined with the content areas of each discipline. The problems outlined in the above are meant to show that this research task is methodological in character. Teaching scientific thinking and creativity is possible only by means of such didactics that can integrate the development of the area of knowledge which is the object of learning on the one hand and the psychic development of student, on the other hand.

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Professionalism vs. reflective professional practice

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Professionally-oriented fields of education constitute a major part of Finnish higher education. They share three problem areas which are interesting research objects especially for research concerned with higher education pedagogics: the multidisciplinary nature of education, the professionalistic nature of education, and the development of professional personality during education. The last two problem areas reflect two different views on the aims of professionally-oriented education. Professionalistic education is based on a novice-expert perspective and is adaptive in nature, whereas education based on a notion of reflective professional practice is emansipatory in nature. In the background there are also various learning conceptions regarding adult students. In professionalistic practice the student adopts information and skills from a more experienced person while the education contains ritualistic evaluation of competence. Reflective professional practice is strived at by means of increased reflectiveness and self-evaluation. The theory of experiential learning offers both an interesting starting point for pedagogical solutions during education and an opportunity for the monitoring of professional development.

The article outlines the differences between professionalistic vs. reflective professional practices. The discussion is illustrated by a pilot study and some educational solutions carried out in the nursing education programme for prospective teachers at the University of Tampere.

1. The concept of professional socialization in research on higher education

Research in professionally-oriented fields of higher education, especially research concerned with the development of professional socialization during education, has been rather limited in Finland. The investigation of professional images, which was initiated in the early years of the reform of university degrees and examinations in the 70s, declined rather quickly.

During last decade, a multidisciplinary approach of developmental work research has evolved within the field of sociology. Apart from the investigation of work, production technologies and work organizations the approach covers also the exploration of professional socialization and the relationship between thinking and work activity (e.g. Arnkil 1986, 50). The latter investigation is, however, concerned with the formation of professional personality during employment in the profession and not during education. Finnish research on professional socialization is also represented by career studies initiated at the beginning of the 1960s by Häyrynen et al. (1982), approaching later the research tendency concerned with life's cycle. The stages of the professional orientation of students of medicine have been described in a work published some years ago (Järvinen 1985). - Finland has remained almost entirely outside the scientific debate, which has been conducted especially in France and England concerning research on professional socialization during education. In the article which I will deal with in greater detail below, Atkinson and Delamont (1985) examine the present state of the research in question especially in teacher education, and discuss such central concepts as profession and socialization in the light of functionalist, interactionist and 'new sociology of education' approaches.

Dimensions of a professionalistic occupation are considered to include the cognitive, the normative and the evaluative dimension (e g. Larson 1977, 47). The cognitive dimension is constituted by the scientific foundation of the profession and the specialized knowledge and skills that the practitioners of the profession have. The normative dimension comprises the service function and the special ethics of the persons practising the profession. The evaluative dimension compares the profession with other occupations underlining its special autonomic nature. To this may be added the collegiate nature and the possibility to control education and recruitment in the field, as features typical of a profession. Especially funtionalists have sought to define objective features that discriminate a profession from other occupations. Many studies have, however, taken a critical stand toward this feature-theoretical view and noted that professional education or the nature of professional work do not contain any discernible special features different from other occupations that could be used to define a profession. It is a question of the representatives of the profession themselves trying to

explain how they differ from others, with the aim to achieve social control and to transform the highly specialized knowledge and skills into high-class economic and social rewards (Atkinson & Delamont 1985; Larson, 1977).

In the functionalist approach, socialization is seen as a process where a novice acquires relevant competences and values and internalizes them. The relationship between professional socialization and practice is a continuum. Interactionists, on the other hand, think that it is not a question of a continuum but of a conflicts of interests between students and the representatives of the profession. The professionalistic aims of education are most often not openly recorded in the curriculum, but they are contained in it in the form of a hidden curriculum.

Hence a considerable part of professionalization consists of the ability to perceive and adapt to such behaviour as is expected by teachers and fellow students, and later on by colleagues and clients (Atkinson & Delamont 1985, and Haas & Shaffir 1982). Atkinson and Delamont (1985) criticize both the functionalist and the interactionist approach of taking the organization of knowledge and the contents of teaching "for granted". The above researchers emphasize that, for example, research on teacher socialization requires investigations of how particular forms of practical reasoning are legitimated (or contradicted) by the manifest and latent curricula of teacher socialisation and how such discourse reflects or reconciles segmented interests within the occupation and the training institution.

Zeichner (1983) describes the paradigms of teacher education by means of the received - reflexive dimension and the problematic - certain dimension. The first dimension refers to the degree to which the curriculum of the teacher education program is specified in advance. At one end of the continuum is the view according to which the student shall, in the capacity of a passive receiver, transfer to him/herself the knowhow contained in the curriculum. According to the view at the other end of the continuum the student is an active participant in the construction of curricular content. - The second dimension refers to the extent to which teacher education sees the institutional form and the social context of education as problematic. At one end of the continuum is the notion according to which the educational and social context in which prospective teachers work, is taken for granted and the success of

teacher education is evaluated in terms of its effects upon on individual students. At the other end of the continuum is the approach which problematizes the institutional arrangements of teacher education and the social contexts of education. By means of these dimension Zeichner (1983) examines four paradigms of teacher education illustrated in Figure 1:

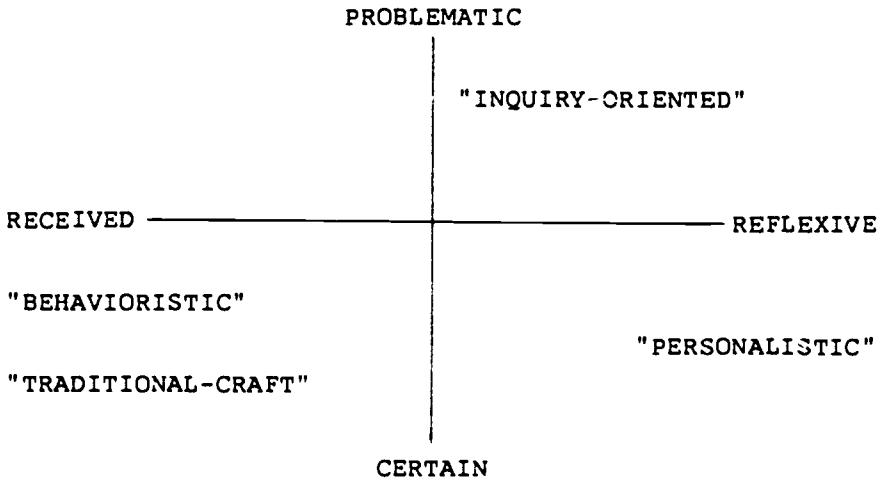

FIGURE 1. A summary of four paradigms of teacher education (Zeichner 1983)

The behavioristic paradigm represents the technical tradition of teacher education where the required skills can be clearly defined beforehand and their achievement can be objectively evaluated. The traditional-craft paradigm, on the other hand, represents the view of teacher education as an apprenticeship process, in which the apprentice via trial and error seeks to discover the "wisdom of experienced practitioners". This knowledge is often hidden in nature, and cannot be clearly defined; it is above all a question of transferring cultural knowledge. Although the tension between these approaches, that is, the juxtaposition of the technical/definable and the hidden/personal knowledge, is obvious, nevertheless, the contents of education and the institutional forms and the social context are taken for granted in both approaches.

According to the paradigm of personal growth, teacher education is a form of adult development, a process of 'becoming' rather than merely a process of educating someone how to teach. This view underlines the importance of individual growth and development, the definition of personal objectives, and the evaluation of the quality of experiences and behavioral purposes. - According to the inquiry-oriented approach to teacher education, the prospective teachers problematize the teacher's role, the tasks of teaching and education in general. They are encouraged to carefully examine the rationales and consequences of all the rituals and routines that they are offered during education and practice teaching. The aim is thereby to develop prospective teachers who are capable of reflective action.

2. Reflectivity and professional practice

The inquiry-oriented view of teacher education approaches the concept of reflective professional practice; although the latter in my opinion encompasses also the personal-growth (experiential) approach. A reflective study of experiences is a central part of the model of experiential learning, where a cycle consists of concrete experience - reflective observation - abstract conceptualization - active experimentation - concrete experience etc. (Kolb 1984, 25-31). - Kolb, however, does not problematize the concept of reflectivity.

Mezirow (1981) has developed a theory of adult learning and education which is based on Habermas's study of the cognitive interests. Mezirow describes the main dimensions of critical reflectivity as follows: *1. the objects of reflectivity* (awareness of our own ways of perceiving, thinking and acting), *2. affective reflectivity* (awareness of what we feel/perceive when thinking or acting in the way typical of us), *3. discriminant reflectivity* (how we evaluate the efficacy of our perceptions, thoughts and actions), *4. judgmental reflectivity* (awareness of our own value judgments which concern our perceptions, thoughts and actions). The above mentioned dimensions constitute the level of consciousness. The next level, that is, critical awareness, consists of the following

dimensions: 5. *conceptual reflectivity* (the study of the adequacy of our own conceptions), 6. *psychic reflectivity* (recognizing the tendency to make precipitant judgments on the basis of limited information) and 7. *theoretical reflectivity*, which Mezirow (1981) defines as a process:

> "by which one becomes aware that the reason for this habit of precipitant judgment or for conceptual inadequacy is a set of taken-for-granted cultural or psychological assumptions which explain personal experience less satisfactorily than another perspective with more functional criteria for seeing, thinking and acting. Theoretical reflectivity is thus the process central to perspective transformation."

The above perspective transformation becomes the central function of adult learning. Mezirow (1981) parallels the perspective transfomation with the concept of emansipatory action. In the study of learning Mezirow comes close to the approach of life's cycle researchers.

In terms of Mezirow's thinking, reflective professional practice means continuos critical examination of the interpretations of one's own seeing, thinking and acting and of the underlying reasons, during education and later on in work. With reference to Schön (1983), Arnkil (1986,5) notes that the difficulty is not only how problems are solved but, to an increasing extent, how they are formulated. It is also a question of the employee's ability to view his/her own work process, its development, theoretical background and connections with other work processes when different individual and collective problems are being solved. - Professions have drifted into a kind of confidence crisis, whereby researchers have talked about both the demystification and deprofessionalization of a profession (Schön 1983, 11; Rothman 1984). Schön (1983, 290), however, notes that even radical critique cannot replace the critical self-reflection of a qualified professional. - In education, the initiation of new inquiry-oriented and self-instructive work activity and the learning of a method for analysing and developing one's own work (Arnkil 1986, 20) becomes most importance.

The first phase of relflective thinking is the recognition of one's own habits of observation, thinking, learning and acting. The model of experiential learning (Kolb 1984) offers a new approach which can be applied in education to the selection, implementation and evaluation of

the contents of this phase. In the following, I will examine small-scale pilot studies which analyse the development of reflective professional thinking in the early stages of education by applying the model of experiential learning.

3. Phases of the pilot study

For purposes of a more extensive research design, the author is developing a method suitable for self-evaluation and the evaluation of one's own work and its follow-up in the teacher education programme of nursing at the University of Tampere. The project does not cover all the parts of the educational programme. The study was initiated in 1985. The first two phases lasted until 1987, and the article at hand discusses the main results of these.

Practice teaching in professionally-oriented fields of higher education is a critical phase during which it is advisable to pay attention to the development of a work approach which imitates the expert vs. a work approach which involves evaluation of one's own work and setting of development aims. Stages in which the method features prominently are:

1. the study course "the development of professional personality" (taken during 1st-year spring term and 2nd-year autumn term)

   The initiation of the first phase of reflectivity, that is, the identification of one's own ways of observation, thinking, learning and problem solving.

2. practice teaching I (during 2nd-year spring term)

   An analysis of one's own "ideal teacher image" and its comparison with the activity of practice school teachers. Immediate goals of professional development (during practice teaching).

3. practice teaching II (during 3rd-year autumn term)

   The development of methods of self-evaluation, the evaluation of the attainment of set objectives and the setting of new objectives.

4. final practice teaching (during 3rd-year spring term)

   An analysis of changes of one's own "ideal teacher image" the study of the attainment of set objectives, immediate goals for first years as a beginning teacher.

3.1. *First unit: implementation of the study course "the development of professional personality"*

The implementation and evaluation of this study course has been reported in greater detail earlier (Järvinen 1989), hence I will here present very briefly the most central starting points, the implementation and some evaluation results. The model of experiential learning was applied to the selection of the contents, the implementation and the evaluation of this phase. The learning objectives were divided into objectives concerned with growth and creativity, the development of learning style and the actual contents. The most central content areas of the study course, equalling three credit units (one credit unit equals 40 hours of study) and distributed over two terms, are as follows:

Part I:
- the theory of experiential learning and problem solving
- perception and communication
- experiential learning theory of growth and development
- creativity in a work community and in adult education

Part II:
- professionalism vs. reflective professional practice
- work counseling as a means of work development
- the development of self-evaluation

The working methods used with each of the above content areas were also chosen according to the phases of experiential learning:

1. concrete experience (students' own problems in working life and exercises in self-evaluation, perception and communication)
2a. reflective observation (scrutiny of the above exercises individually and in groups),
3. abstract conceptualization (lectures and articles meant for self-studying),
2b. reflective observation (again in small groups and the entire group together)
4. active experimentation (homework: application exercises)
2c. reflective observation (scrutiny of the above in the group)

The qualitative evaluation methods of the study course could be grouped into methods that were used when examining a) the stage when students transfer from concrete experience to reflective observation and b) the stage when students transfer toward abstract conceptualization and active experimentation. The evaluation methods used in the first mentioned stage included open questionnaires and personal diaries. The second stage was evaluated by means of student essays about the development of one's own work and about the setting of personal development objectives.

The first part of the study course has been carried out three times and the second part twice. The study course has been attended by 48 students with specialized nurse qualifications and extensive work experience. Two thirds of the students are over 30 years of age. Typical of the life situation of these students is that they have an occupational diploma, strong professional identity and extensive work experience. Many of them are also at a stage when they are assuming a new perspective in life, and hence willingness to adopt this kind of reflective study approach is obviously great. It is also very important for adult students who have been long in working life, to identify and develop their own learning style at the beginning of higher education studies. - Evaluation results have been examined briefly in section 3.3.

3.2. *Second unit: examination of own conceptions about teacher's qualifications vs. teachers' activity*

As mentioned earlier, the next phase of the pilot study was concerned with students' way of analysing their own conceptions about teacher's qualifications and about work during different stages of practice teaching. Right at the beginning of studies in autumn 1985 students were asked to describe what is their idea of a good teacher of nursing and what is important in the work of a teacher of nursing. At that stage nearly half of the students had some teaching experience. It has been noted in several research studies (Atkinson and Delamont 1985) that the teaching practices of prospective teachers are to a very large extent directed by their own school experiences and their image of their own teachers. - The study course "the development of professional personality" was given

before the beginning of the practice period. - Students were allowed to evaluate and revise their answers in February 1987 before the beginning of practice teaching I. Practice teaching I contained a considerable amount of monitoring of teachers' work and lessons in schools of nursing.

In June 1987 after practice teaching I, students were given the following questions to answer: 1. What characteristics of a "good teacher" were easy to identify? 2. What characteristics of a "good teacher" were difficult to identify or which of them occured clearly less frequently? 3. Did you experience a conflict between your own "good teacher" image and the professional images of teachers that you encountered? If you did, what? 4. On the basis of your observations, do you think you ought to correct/complement/change your image of a "good teacher"? 5. What realistic development objectives would you like to set for yourself concerning practice teaching II? Students were further inquired to what extent they thought it possible to attain the objectives and how they would like their attainment to be evaluated. Students, who started their studies in September 1985, took part in all these subphases, (N=10).

At the beginning of studies, the descriptions of a good teacher contained the following factors: good mastery of the subject, ability to organize the subject matter to be taught, communication and interaction skills and student knowledge. The descriptions also contained quite a few adjectives depicting a "good person", which as such were not necessarily connected with the nature of teacher's work. A few answers examined more widely the relation of teacher's world view and concept of man to teacher's work. The answers change in 18 months so that references to the students increase, special emphasis is put on the student's own input as a goal-setting, active learner; a process that the teacher should support. Similarly, references to teacher's own development increase.

According to students, it was easy for them to identify, as characteristics of a good teacher, factors related to content mastery, expertise, variation of working methods and organization of subject matter and also atmosphere or teacher-student relationship. On the other hand, as characteristics of a good teacher that were difficult to identify, students mentioned individual and flexible teaching, the nature of interaction, and the pedagogical and scientific solutions and underlying rationale in teaching. Some answers also commented on the difficulty to see how the teacher evaluated his/her own work. As factors causing

greatest conflict between one's own image of an ideal teacher and the perceived teacher activity, students mentioned a rigid and formal attitude attitude to students, a learning concept underlining the student's passive role as a learner, teacher's weak professional identity and nonexistent evaluation of one's own work.

The most interesting finding was that students wanted to alter their own image of an ideal teacher in the direction of the factors that they considered difficult to identify in the activity of a qualified teacher or the factors that occur to a lesser extent. Further, they also set these factors as their own development objectives for practice teaching II. Nearly every student wanted to alter their own teacher image by underlining the importance of increased flexibility and permissiveness in the teaching situation, of allowing scope for students' own solutions and of encourganing students' own thinking and ideas. Many teacher students also emphasized the necessity of clearer pedagogical principles and foundations. Quite a few of the development objectives are indeed associated with getting to know one's own students better, increasing teacher-student cooperation and developing a more experimental and bold approach to work.

3.3. *Summary of the evaluation of the units*

The application of the model of experiential learning to the selection of the contents, study modes and evaluation methods for the study course "the development of professional personality" proved a successful solution; especially the inclusion of adult students' work experience in the learning process as a motivating factor (Järvinen, 1989). Maybe one of the most central results was the students' willingness to experiment and apply what they had learnt in their work. However, it was more difficult for them to analyse and develop their own learning style. Obviously it would require more extensive practice and consultation throughout the whole teaching programme. To be able to understand the learning and development of an adult student and to identify points of change, helps both the student and the teacher to analyse professional development during education.

When students coming from working life constructed their image of a teacher at the beginning of the practice period, there was no copying or

adaptation of ready-made teacher models. Instead, students examined critically the potential shortages and development needs appearing in them and readjusted their own view of teacher's activity on the basis of that. It would obviously be advisable to include critical comparison of one's own ideal picture and an expert's work especially at the beginning of the practice period in vocationally-oriented fields of education, before the practice of routine skills frustrates this possibility of a more comprehensive analysis. At least as important as the practice of certain pedagogical skills is the student's possibility to evaluate the work of a qualified teacher and together with him/her to discuss the rationale underlying teacher's solutions. This possibility of open dialogue may be a crucial prerequisite for that the student adopts continuous evaluation of work as the starting point of its development, both in the form of self-evaluation and in collaboration with other teachers. Teachers have to be able to conscisously submit "hidden and personal" knowledge and skill to evaluative discussion and comparison of alternative modes of action. In his research on the problems of a beginning teacher Vonk (1983) has noted that during their training most teachers develop an idealistic conception of their role as a teacher with the following characteristics:

- emphasis on teacher-student interaction;
- emphasis on the individuality of the children;
- emphasis on the self-determination of the children.

Most of the schools practise a different conception with emphasis on:

- the responsibility of the teacher for the organisation and control of the teaching and learning activities;
- a hierarchical teacher-student relationship;
- the ideology that children cannot bear responsibility and have to be disciplined.

Vonk (1983) further notes that during the practice period prospective teachers often have to alter their conception to coincide with the school's conceptions which are often also reinforced by pupils' expectations.

In the development of reflective professional practice, the student-instructor -relationship plays a central role during the practice phase; whether it develops into an authority relationship of master-apprentice or into a discussion where prospective colleagues analyse their work. The model of experiential learning offers an frame of reference for learning

also during practice teaching. Thereby the learner moves along the two basic dimensions of the learning process. The first dimension represents the concrete experiencing of events at one end and abstract conceptualization at the other. The other dimension has active experimentation at one extreme and reflective observation at the other. Thus, in the process of learning, one moves in varying degrees from actor to observer, and from specific involvement to general analytic detachment (Kolb 1984, 30-31).

Reflective professional practice as a learning and development process starting during teacher training is the research area with which the actual research study succeeding the above pilot study will be concerned.

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PART IV

Studying as a life phase and the progress of studies

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Though the bulk of students in Finland initiate their higher education studies relatively soon after completing the upper secondary school and then carry on as full-time regular students aiming at a degree, digressions from this pattern are becoming increasingly common, as in many other countries. One concrete feature is the growing number of adults in the student body, in other words, it is becoming increasingly common to start the studies for a basic degree at an adult age.

The incompatibility of the life phase of young adults with the present form of studying for a basic degree is clearly reflected by the number of dropouts. The statistics for those students who began their higher education studies in 1975 and 1977 show that during the first six years 8 % of university entrants under 20 interrupted their studies and 29 % of those who had been 25 at the time of their entrance.

The situation is susceptible to many kinds of pressures. Re-training demanded by society leads to an increased need of higher education for adults, at the same time when universities are held more accountable for their outcomes in terms of the number of graduates. Moreover a great number of young students are left outside higher education or must wait for their start in the grip of the selection machinery or get "wrong" kind of intermediate training, and meanwhile they are getting older.

1. Introduction

The traditional conception of higher education studies as a special phase of life involves, among other things, the following assumptions:

1. Studying takes place at a certain age between youth and adulthood.
2. In comparison to people who move into the working world through shorter training programs, studying implies a postponed adulthood especially in the roles of producer, consumer and reproducer.

3. Studying means that part of the age cohort is partially isolated from the rest of society, for a fixed period of time.
4. Studying prepares people for highly responsible and/or elitist roles in society by providing part of the young, for some time, with an opportunity to experiment with and evolve new thought patterns and solutions in a situation where these experimentations still have no real consequences.
5. The phase of studying, occuring in separation from society, produces new intellectuals who, after their return to society/adulthood, are useful in a very special way and also capable of renewing and/or conserving society better than those who have been living in it all the time.

Originally, this sort of stereotype was not only somewhat consistent with reality but also necessary to help justify and tolerate the existence and life style of students, which is so different from their peers. The mass-scale higher education has made it necessary in a new way: the planning, tailoring, resource management and evaluation of education for the masses might have appeared to be an administratively impossible task without at least a statistical unit, called a "typical phase of studying", with its duration and other characteristics. Paradoxically enough, the same mass education has tended to crumble this basic planning unit and to distance it from reality, at least in combination with efforts to promote educational equality and the mobilization of intellectual resources.

It was possible to ignore the problem as long as plans and calculations were made only in terms of openings or entry places. Nevertheless, an awakened interest in educational outcomes (in terms of graduates and trained labour force) and its effectiveness resulted in Sweden even in the 70s in observations which cast doubt on the conceptions of studying as a coherent and fixed-term unit: sophisticated statistics indicated that the student body had become more heterogeneous in age and more adult, that studies started at an adult age progressed less steadily than those started as young, and that the age differences of students were sufficient to explain the "differences in effectiveness" between educational/training units (Abrahamsson 1984 and 1986; Dahllöf 1975 and 1984).

The purpose of this paper is first to present a few related observations from Finland and then to return to the discussion of at least some if not all of the possible factors involved.

2. The age of university entrants and the progress of studies

On the basis of data files drawn up by the Central Statistical Office (Hermunen 1985 and 1987), it is possible to examine the study progress of all those students who started their basic degree studies during 1975 and 1977 (altogether 21267 persons), up to the autumn of 1984. Figure 1 presents in a summary form information by entrance age groups in higher education, showing what proportion of the entrants have interrupted their studies during each six first years, without taking any degree (according to the official degree register).

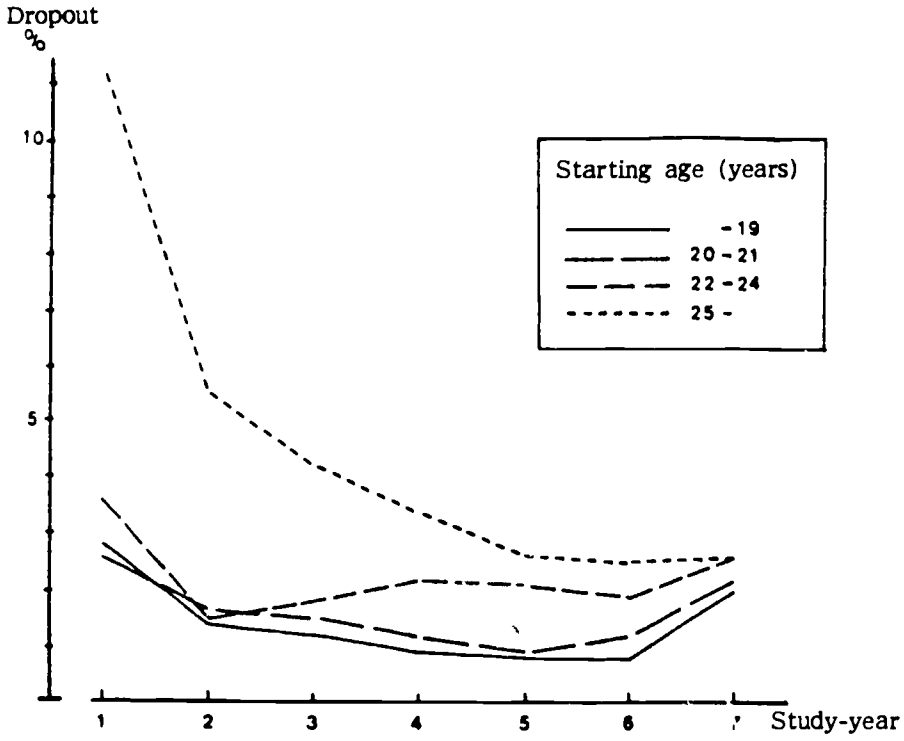

FIGURE 1. The annual dropout rate in higher education studies by entrance age groups

A total of 7.9 per cent of the entrants under 20 interrupted their studies before the beginning of the seventh academic year; 9.0 per cent of entrants in the 20 to 21 age group, respectively, 13.1 per cent of the 22 to 24 age group, and 29.4 per cent of those who were 25 at the time of their entrance to higher education (for exact figures, see the tables in the 1987 article by Mäkinen). Interruption of studies is clearly higher in the oldest group than in the other groups during the whole follow-up period; in comparison with the youngest group it is even 4 times higher during the first two years and still 3 times higher in the sixth year.

During their first three academic years, the three younger groups are, practically taken, equally (seldom) prone to interrupt their studies.

After this time, the graph of the 22 to 24 age-group shows an interesting rise, approaching that of the oldest group, in other words, when also these students are clearly over 25, the number of dropouts also rises, although their studies have already progressed further from the early stages.

Figure 2 is based on the same material showing, by the field of education, the total share of dropouts in the different entrance age groups who have taken no degrees. There is a very clear and uniformly shaped connection between the age of the entrants and the interruption of studies, which can be seen in all fields of education, with the exception of the small group of entrants in the field of dentistry, which has very few dropouts. The sharpest effect is found in the students of Physical Education: nearly 50 per cent of their oldest group have interrupted, but not one of the youngest. (It should be noted that the total interruption rate of studies is not particularly high in this field; it is high specifically in the group of old entrants.)

Also the sex-based data point to the same general direction (in articles by Mäkinen 1987 and Mäkinen & Valkonen 1987a); the youngest entrants of both sexes generally advance most steadily, and the oldest ones drop out most frequently in all fields. The few exceptions that are found are male students, among whom the very youngest starters are in some fields (psychology, commerce and business administration, technological-scientific fields and medicine), less reliable to continue their studies than those in the 20 to 21 entrance age group.

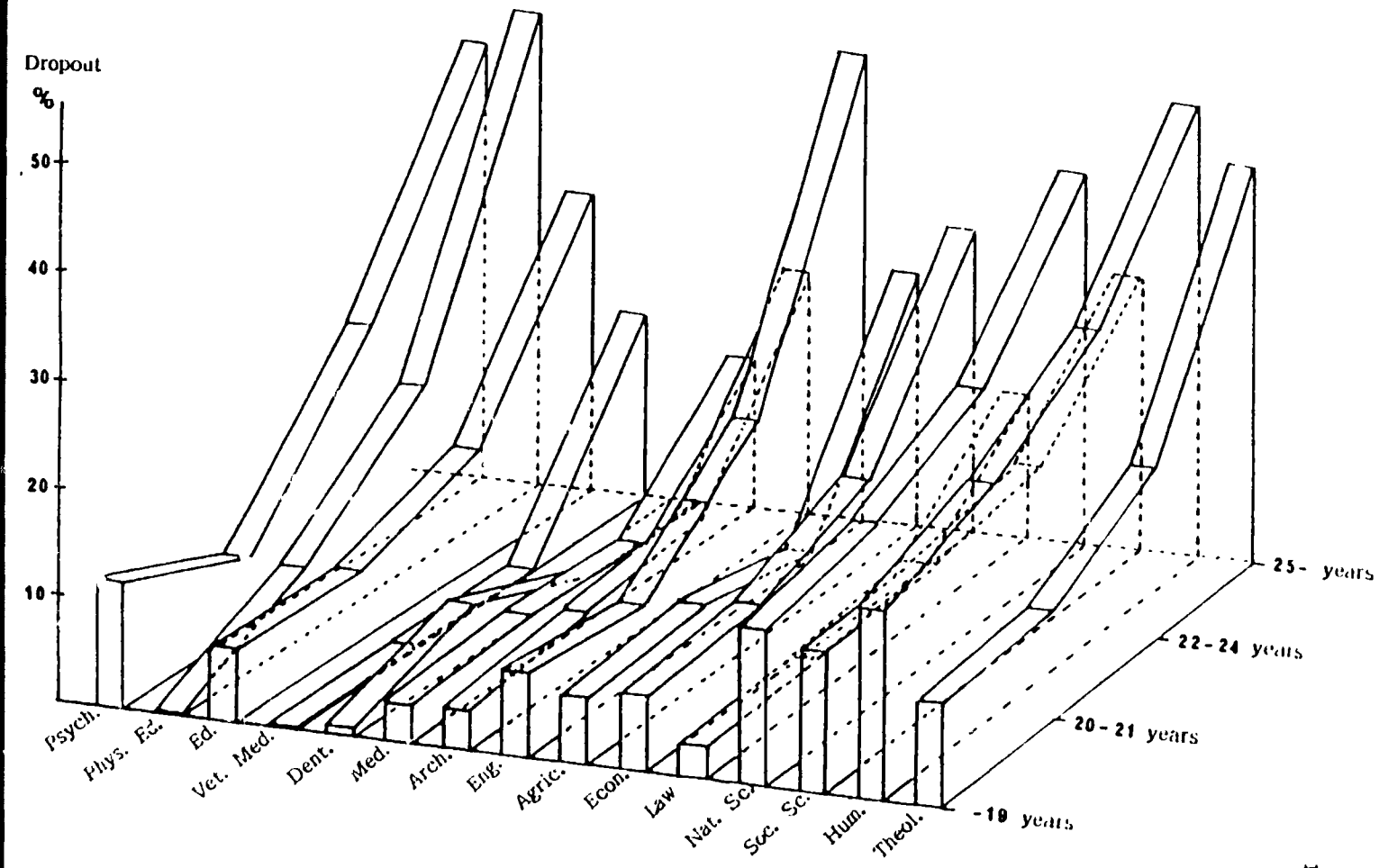

FIGURE 2. Dropout (percentage of the entrants during 7 years) by first field of education and entrance age

On the whole, there is thus many-sided evidence indicating that if higher education studies are started at an older age - especially after 25, but partly also at 22-24 years of age - it means that there will be an increased risk of interrupting the studies.

3. Background factors of starting belatedly

It is possible, that students' belated entry into higher education is connected with the same individual factors as their subsequently emerging low study achievements, i.e. factors like generally poor readinesses and capabilities for studying. This assumption is lent indirect support by an investigation concerning the 1980 upper secondary school graduates - altogether 28 664 persons - (Mäkinen & Valkonen 1988), and their placement in post-upper secondary school education/training, up to the end of 1985.

A clear majority of both male and female laudatur students (90 per cent of the men and 73 per cent of the women) and also of those males who graduated with the general grade magna (60 per cent) are enrolled in higher education after the upper secondary school, whereas the first further education place of those with lower general grades is more frequently found in secondary level education. At the same time, laudatur-students' enrolment in education after the upper secondary school is notably faster than their peers; 57 % enrol immediately during their matriculation year and 25 % during the next.

TABLE 1. Enrolment age in higher education studies and success in the spring 1980 matriculation examinations. Upper secondary school graduates in 1980.

General grade	Higher education enrolment age, years -19	20-21	22-24	25-	Entrants total	Entrants' share(%) of the group
Failed*, N	261	197	92	19	569	27.3
row-%	45.9	34.6	16.2	3.3	100.0	
column-%	6.3	4.6	5.7	7.6	5.5	
Part. exam.*,N	261	568	269	17	1115	29.3
row-%	23.4	50.9	24.1	1.5	100.0	
column-%	6.3	13.4	16.7	6.8	10.9	
Approbatur,N	1	1	3	1	6	0.8
row-%	16.7	16.7	50.0	16.7	100.0	
column-%	0.0	0.0	0.2	0.4	0.1	
Lubenter, N	21	107	125	23	276	6.1
row-%	7.6	38.8	45.3	8.3	100.0	
column-%	0.5	2.5	7.8	9.2	2.7	
Cum laude,N	179	408	339	44	970	18.2
row-%	18.5	42.1	34.9	4.5	100.0	
column-%	4.3	9.6	21.1	17.7	9.5	
Magna, N	1103	1401	532	82	3118	44.7
row-%	35.4	44.9	17.1	2.6	100.0	
column-%	26.6	32.9	33.1	32.9	30.4	
Laudatur,N	2327	1571	246	63	4207	81.1
row-%	55.3	37.3	5.8	1.5	100.0	
column-%	56.0	36.9	15.3	25.3	41.0	
Total, N	4153	4253	1606	249	10261	35.8
row-%	40.5	41.4	15.7	2.4	100.0	

* Since the data are concerned only with the spring examinations, the final general grades of these groups are not known.

Also the connection between students' entrance age into higher education and their general grade in the matriculation examination is shown in Table 1 (spring 1980 examinations). We can see that the different entrance age groups are distinguished from each other by the

proportions of laudatur-students in particular, and by the proportions of lubenter and cum laude-students, on the other hand. In this follow-up time range (five years after matriculation), the increase of the 22 to 24 age group is the clearest indication of the effect which below-magna certificates have, in postponing students' enrolment in higher education. It may be essential that the general grade is an even stronger distinguishing factor which determines, whether a student has or has not entered higher education by autumn -85 (Table 1, the right-most column). The reserve of potential - and thus inevitably old - starters is still great among those students who received below-laudatur certificates. In case also this graduate year-group takes its full share of the annual openings in higher education, there may be some 1000-2000 of them yet to come.

Secondly, we can focus on another factor which causes belated entrance into higher education, namely, when higher education studies are started only after vocational secondary education studies (Table 2, p. 117). We can see that 18 per cent of those who during the follow-up period, had started in higher education, had done so after having taken at least one vocational degree. The use of this roundabout route has transferred higher education enrolment typically to the age o 22-24, in average two years later than those who entered higher education directly. Even according to this follow-up study, there will be found a great reserve of potential higher education starters among vocational graduates (over 12 000 persons), and also among those with no kind of degree (6000 persons).

A closer examination of the connections between success in matriculation examination and entrance into higher education and route to it (has/has not enrolled, directly/via vocational secondary education), shows that the general grade is a clearly more powerful predictor of eventual entrance into higher education than of the route. The grade distribution of those who enter higher education through the vocational secondary education, is however found between the direct entrants and those who are left outside higher education, their top grade being magna (36 %) in lieu of the laudatur of the direct entrants (44 %).

TABLE 2. The enrolment age of students in higher education, directly after matriculation and after having first taken a vocational degree. The 1980 upper secondary school graduates.

Enrolment situation	Age when higher education studies have been started, years				Starters total	Starters' share % of group
	-19	20-21	22-24	25-		
No vocational secondary degree N	3918	3457	855	190	8420	58.3
row-%	46.5	41.1	10.2	2.3	100.0	
colum-%	94.3	81.3	53.2	76.3	82.1	
A vocational secondary degree N	235	796	751	59	1841	12.9
row-%	12.8	43.2	40.8	3.2	100.0	
colum-%	5.7	18.7	46.8	23.7	17.9	
Total, N	4153	4253	1606	249	10261	35.8
row-%	40.5	41.4	15.7	2.4	100.0	

What is still lacking in this connection, for the time being, is empirical knowledge based on more exact analyses of the ultimate significance of the matriculation examination and entrance age for the progress of higher education studies and for their interruption, in particular (see however Lehtovaara's (1972) study of upper secondary school graduates in the 1950s). It seems that the general grade does not function automatically as the direct principal explanatory variable of success. It may equally well be that student's age has the greatest significance, together with related life phase and life situation factors, whereas the upper secondary school certificate might function mainly as a factor that regulates the starting age of studies.

4. Development prospects

The Finnish higher education policies - unlike those of some other countries, especially Sweden - have not actively promoted studies for a basic degree conducted by adults and by groups of heterogeneous backgrounds (Abrahamsson 1986; Silius 1987; Schutze 1986). Thus the number of those who start their studies as proper adults has been relatively small, though continuously increasing: less than 12 % of those who began their studies in 1975 were 25 years old, ten years later the figure was 16 %. At the same time the proportion of the under -20s among university starters has evenly declined from 36 % in 1975 to 31 % in 1985. Furthermore, the statistics show that while 24 per cent of the 1975 upper secondary school graduates were admitted to higher education already in the same year, only 13 per cent of the 1985 graduates could start the same year. Parallel to the increase of the proportion and number of actual adult students, the group of "basic" students thus also becomes older - probably mainly due to students' selection problems and, especially since the late 70s, the boom of upper secondary school graduates.

What is reflected by the interruption problems of adult students is chiefly that the basic study programmes, in their present form, are ill-suited for the life situation of adult people. Part of the failures in adult studies are probably produced by the lack of short-duration study forms in Finnish higher education and the generally underdeveloped in-service/further education system (Silius 1987). In the absence of alternatives, people drift to basic study programmes even though the need would be of something else.

Concerning those interrupting adult students who already have acquired some vocational training and thus tend to be easily employed in the middle of their studies - how many of all we don't know - the problem is not perhaps very serious. These people who are drawn out of the universities by some external "pull factor" (Parjanen 1979) probably experience only a rather modest personal failure, but the most visible result which follows is that the monitoring of student performances in higher education is complicated and, what is even more serious, a study place is lost for some student whose primary goal is to take a degree.

The aging of the group of regular "basic" students may lead to somewhat different consequences which affect the whole education system, especially if, also in Finland, it is combined with increasing part-time study and paid employment during studying, without vocational qualifications and in fields that are not related to one's studies (Abrahamsson 1984, Ciucci 1984, Sorvettula 1986, Storhammar 1986). This will also result in a significant number of people who encounter serious failures in their studies and are left entirely without a vocational education and whose employment problems can be aggravated in course of time. More generally, it may be that the increasingly common gainful employment of also young students - as well as school students - can lead to a radical wrecking of the assumption of "studying as a life phase", and to a new kind of overlapping of studying and other social roles, and to a considerable number of new challenges for the entire education system. In the first stage, all this will certainly imply mainly serious disturbances, but in the long run, it may turn out to be only a systemic reaction to that development where the isolation of studying from normal life, together with the prolonged period of studying, will lead to impossibilities.

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Adult studies: seeking for status?

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This article considers how the theory of status or "exclusiveness" can be applied to adult education, especially the open university studies in Finland. Various motivation researchers in the adult education field have proved that many adult students study with the object of increasing their professional competence or for self-development. This exclusiveness theory gives the possibility to examine theoretically and empirically whether the objective of some students is to distance themselves from a reference group. The paper includes the empirical study among open university students. The data were first obtained quantitatively then qualitatively. In general, the exclusiveness factor appeared to be missing - or hidden - in the questionnaire study. The thematic interview yielded more detailed information about the unconscious structures of adult studying.

Finnish universities have recently been faced with a new phenomenon, which could be described as "adultification of higher education". This concept actually refers to two different aspects: first, the relative proportion of adults among undergraduate students is increasing, and secondly, the system of open university is now closely linked with the administrative and educational structure of universities. Traditionally oriented university teachers initially believed this phenomenon to be just a trendy fashion which would be over in no time, but now it seems that this phenomenon has come to stay within the Finnish higher education institution. Even the schools for young people are today regarded as part of life long learning. This way of thinking shows that adult education has finally established its status as a component in the totality of education.

Typically, the Finnish educational policy favours a very rigid tubelike structure of the educational system, which allows no straying from the correct path. Therefore it is to be feared that the weak sides of other forms of education, i.e. dysfunctions and latent functions, will emerge in adult education, too. One such drawback could be the

commodification of adult education, especially of continuing professional education. Another harmful result could be excessive legitimization of adult education in working life, whereby adult education might adopt the same kind of status elements as the prestigious undergraduate studies already have. This is a characteristic feature in Finnish society.

This article considers how the theory of conflict and status groups can be applied to adult education, especially the open university studies. According to the theory put forth here, the object of training is, in reality, to control the job market by developing an exclusive language, by means of which the initiates are clearly distanced from outsiders. Training thus maintains competition between status groups and is hence a force exercising a marked societal power.

The goal here is to examine empirically whether there are other motives involved than professional advancement and personality development when adults participate in continuing education. To what extent might exclusiveness and status group factors, for example, serve as motivators?

Since Finland has developed its own organizational model for adult extension training, it is interesting - both from theoretical and practical angles - to analyse how different management- and decision-making models are applicable to this kind of operation. In order to grow and develop, the new open university institution must find its own place in higher education. It is equally important, however, that it is able to establish its own legitimacy.

1. Status and exclusiveness theories

The theory of exclusiveness and status groups created by Randall Collins (1971, 1979) belongs to the qualification theories which explain the relationship between training and working life, and which are based on the teachings of Max Weber, the sociological classic. According to the theory, training socializes individuals into certain status elites. This article considers the possibility that *many adult students do not study with the object of increasing their professional competence or for self-*

development - as they frequently express in questionnaires - but, indeed, their objective is to distance themselves from a reference group.

Status group are distinguished from each other by things like speech and behavioural styles and value-orientation relations. One may accordingly ask, what is the significance of education in the formation of these characteristics. The well-known analyst of this socio-cultural area is the French scholar Pierre Bourdieu (1977, 1979, 1986), who has introduced the concepts of social and cultural capital to elucidate the relationships between education and working life.

Without getting intimately involved in the verification of different theories, let it simply be stated that in studies in the field of the sociology of education, the factor most closely related to participation in adult education has been the participant's social status. Of the individual factors involved, prior education appears to be the most important: the more prior education a person has, the more she is likely to participate in adult education. Various studies came to these conclusions as early as the 50's (eg. Reissman 1954; Scott 1957; Wright & Hyman 1958; Brunner et al. 1959).

In studies done in the 60's and 70's into the motives for participation in adult education, three dimensions are easily discernible:

1. for the sake of learning itself, for gaining knowledge, and for improving one's general education.
2. for practical reasons, to improve one's professional position, education is the means to an end.
3. for the purpose of establishing social contacts, for companionship, for entertainment.

(Houle 1961; Johnstone & Rivera 1965; Husén 1977; Boshier 1971; Morstain & Smart 1974)

In more recent sociological and adult educational studies the consensus has been that the motives for participation are more complex than the division into the above three dimensions. On the one hand, a particular student may have many different reasons for studying, and the placement of that student into merely one motivational category is not possible. Between purely learning-oriented and enjoyment-oriented goals for students there can often be a middle ground of motivations which have characteristics in both directions.

The question could now be asked, into which of these three previously described dimensions we can fit the motives of status and exlusiveness. When the primary motive for studying is the desire to establish a distance from and barriers to one's reference group, does this represent a search for "knowledge", "utilitarian needs" or "entertainment" dimensions? It is apparent that studies motivated by *status-seeking do not fit in any of these categories.*

As an alternative to the technical-function theory of education, Collins offers a conflict theory of stratification, in which education acts as a kind of weapon in the struggle for power and prestige. *This point of view is used as the basis for the exclusiveness theory.* Collins' approach is "Weberian", where society is seen as being comprised of associational groups which share a common culture and a common sub-culture. A common "cultural-property" is a key resource for these associational groups which Weber called "status groups". Collins calls these "consciousness communities". The nucleus for this group or "community" could be, for example, family and friends, but on a larger scale these groups might be religious, educational, or ethnic in nature. People find their way into these groups according to their life style and status.

Generally speaking "consciousness group" members hold an equal status which is based on their common culture: styles of language and clothing, manners, rituals, values and opinions. The group gives its members a common basis for shaping their identity. Membership is more or less exclusive, and there is a tendency to try to establish a clear boundary between the group and those outside it. Prestige and legitimization requirements are typically also involved.

Within society there is a continual struggle for wealth, power and prestige. Everyone wants to maximize her own rewards. Wealth, power and prestige are inter-related, for example power and prestige improve one's possibilities for amassing wealth. If even a small group begins to acquire more than their fair share of these "goods", those on the outside will begin a counter-struggle to avoid subjection and disregard.

Organizations are typically made up of more than one status group, and within one organization the different status groups struggle for power. The status group controlling the organization hires, fires and manipulates others. This controlling group will try to recruit members of the same status group, especially for the higher positions in the

organization. When hiring members of other status groups for the lower positions, care is taken to ensure that these people respect the cultural superiority of the controlling group. The employer can use education as the basis for hiring people of specific status groups for different positions in the organization. The division into status groups is largely based on education, and employers use education as the criteria for selecting people with particular cultural attributes.

Schools can be viewed as part of a multidimensional struggle between status groups for economic advantage and prestige. According to Collins, when schools are viewed from a historical perspective, education can be seen as having been established primarily to serve the organizational needs of a status group. People use and have always used education as a means of establishing a cultural distance from other people and groups. Power and wealth are involved her, along with status.

2. Quantitative data

At the University of Tampere's Institute for Extension Studies there is in progress an empirical study in the sociology of education, attempting to verify the exclusiveness theory. A questionnaire was used in 1987 to gather data from students studying in the institute's Open University division. A systematic sampling of 392 subjects was taken from a student population of 1604. The percentage of returned questionnaires was 74. These data were first obtained quantitatively, and were therefore somewhat problematic methodologically. For this reason, information related to the exclusiveness theory were gathered from the same sample by qualitative means, using thematic interviews.

In this connection, more detailed statistical data of the open university division of the University of Tampere are not discussed (cf. Parjanen 1988, 5-6; Parjanen 1989). It should be noted, however, that the theory of educational cumulation is true here, too: the students have already had a good prior education before their present studies. For example, 68 % of them have taken their student matriculation examination.

The study group was questioned as to what factors had led to their choice to study in an open university. The questionnaire included 14 possible reasons. Each of these items had a response scale from 1 to 5 (from "this factor was highly significant" -- to -- "this factor was not significant").

TABLE 1. Status-factors involved in one's studies (N=364)

	% high involved 1-2	3	4	% low involved 5
1. Studies in an open university are more prestigious than studies in other adult education institutes	10	20	25	44
2. Increase in prestige at the working place	10	24	26	39
3. Increase in prestige in one's peer group	3	16	25	55

Table 1 shows that status elevating factors were ones which, in the view of the response group, were not important in their decision to study at an open university. The three status-related items - "studies in an open university are more prestigious", "increase in prestige at work", and "increase in prestige in peer group" - were chosen as being one of the student's three major reasons in only 1 - 2 % of the cases. No one picked any of these three factors as being the most important.

This provides the first answer to the question "Do open university students study for status elevating reasons?". The percentages clearly negate the hypothesis.

The second answer is provided in Table 2.

TABLE 2. Agreement/disagreement with educational status items (N=392)

	% agree	% don't know	% disagree
1. Free-time studies for self-respect improvement	40	24	36
2. University training is a means for establishing distance from average people	17	14	69
3. Free-time studies are a means for establishing distance from other people	19	18	64
4. Studies are useful for improving social status	42	24	34
5. Studies are a way of improving one's prestige	40	19	41

Taken from a battery of 15 items, the five selected here are thought to measure exclusiveness and status factors in the best way. Two of the items in the table (numbers 2 and 3) are seen as especially good indicators of these factors. This table points toward the same conclusion as the first table, namely, that *as measured by this type of questionnaire, two thirds of the sample do not see exclusiveness as the motive for adult studies.* On the other three items of Table 2, the response distribution is greater (the original 5 response scale is her reduced to 3).

In general, the exclusiveness factor appeared to be missing, or at least well hidden, when measured using these methods. The questionnaire included, among others, the following three items:

	agree
"Most people would have the intellectual capacity to study in an open university"	74 %
"When one takes the effort to gain knowledge, it is natural that the reward should be a better position"	74 %
"General academic competence should be made easily attainable for everyone."	69 %

The responses show a positive attitude towards an *individual's possibilities in education.* This kind of attitude is apparent throughout the students of the open university.

Crossing some background variables it is apparent that there is no difference between women and men with respect to response to the three status-related items of Table 1. However, there were significant differences between men and women on the other items as follows.

Clearly more men than women have indicated as reasons for studying:

- to learn a totally new occupation.

Clearly more women than men:

- to gain new friends and contacts.
- as a change of pace for free time activities.

More detailed empirical quantitative findings are presented in other publications (Parjanen 1988, 6-13; Parjanen 1989). Among other things, the high correlation between exclusiveness and adult students' age, sex, social background and class consciousness is quite obvious.

3. Qualitative data

When questionnaires are used to gather data related to values, social norms, emotions or any aspects that people are unconscious of, the research results will always contain some defects. The above material is no exception in this respect. Emphasizing one's own status and exclusiveness professionally or educationally is something that Finnish

people do not like to do explicitly. Consequently, it was decided that the material should be complemented quantitatively, i.e. by using thematic interviews. In the present study the themes that were examined were the following: what were the attitudes of the employer, colleagues or fellow workers, family, relatives and friends towards the interviewee's open university studies? The adult students were also asked about their own attitudes towards their studying, and also about their relationship with the academic world.

The interviews were done by two advanced women students, one majoring in adult education and the other in education. The interviews (10 people in all were interviewed) were recorded so that all that was said could be taken down as authentically as possible. (The English translation does not show exactly the Finnish expressions.)

In this connection, we are not going to deal with the problems of reliability and validity which are so typical of thematic interviews. Instead, we have compiled a list of expressions which are related to the status theory discussed in this article. Even if these individual emotional expressions lack general applicability, they clearly show that adult education does contain lots of elements related to personal and professional status.

Studying in the open university division of the Institute for Extension Studies is often experienced by the students as "of higher level" and "of the academia" than studying in other adult education institutes such as adult evening schools (non-academic):

> "In the adult evening school I always felt that the teaching was somehow too *elementary*, particularly things like studying English - it was the same old thing, as if I had started in secondary school all over again."

> "It may well be that it (the open university) is valued more highly than an ordinary adult evening school, at least here in the country it is still somehow *higher and less familiar*, the adult evening school is somehow more familiar since it is so common."

During the interview the open university students pointed out repeatedly that after they had passed a couple of examinations their self-respect and self-confidence were clearly higher than before:

> "Indeed, *I now feel I have the courage to talk to just anyone*, I haven't come across a person yet with whom I

> couldn't talk... but if I hadn't taken these exams, if I hadn't studied or didn't have this background, I would probably be different, actually quite different; it has all been tremendously positive."

> "It has given me a good feeling, as if I was somehow different from what I used to be: *more courageous, more free and I now dare to open my mouth in front of other people* and express my own opinion if I know anything about the matter that is being discussed. I am not sure if I could make a speech in front of a big audience, just ex tempore, you know, but I think that it has done me a lot of good... I don't feel so helpless any more and - how should I put it - I no longer look at things as from around the corner. I have the courage to face people now."

Learning about scientific research results, for example, places the open university student in a new position. His background knowledge is better than that of a person outside open university:

> "I do have a different attitude towards all kinds of problems, I feel that the world is not upset by any small things, *since now I can more or less guess why these things happen.*"

The working environment is a very important reference group to an adult student. Situations at the place of work often provide the incentive for studying:

> "If I hadn't changed at that stage and had remained at the factory and had never ever become an adult student, I am positive that *I would be a different person* from what I am now: I now have a more interesting job which has given me a lot of stimuli, and at the same time I have had the guts to study, I would say that for my own part I have prevented myself from becoming just another apathetic worker on an assembly line."

On the other hand, the working environment can also be too close as a reference group. In such a situation, the interviewee clearly seems to hide something in order to avoid unnecessary risks:

> "Particularly if you study further, say until the cum laude qualification, you'd better be quiet about it because it is not to your advantage. Especially in these jobs where there are lots of women and the everyday conversation is on such a level that when you don't agree with them and the start thinking more about the problem, you may end up in a conflict situation, *you mustn't stand out too much*... one has really learnt not to draw too many conclusions about these conflicts and other things that may happen."

There does not seem to be competition or secrecy among friends, however. After all, one can choose one's own friends. The interviewees experienced their friends' attitudes towards adult education as favourable and encouraging:

> "Then she finally told me that, you know, she enjoys talking to me much more than before, that in a way I seem to share opinions with her, and she values that, and she said that it has done a lot of good to me, and she also said *you are like a new person now.*"

The exclusive nature of open university studying came up quite often in the interviews:

> "Over and over again it happens to me that someone whom I have not seen for a long time asks me: *Are you still going to university?*"

> "Just coming here to the Institute for Extension Studies to study improved my self confidence enormously... yes, that's true really when I think that I was quite young then. *Oh, it did feel fine.* I was much more childish then. I was awfully proud of my achievement."

The thematic interview used qualitatively in this study proved clearly that the data collected quantitatively by means of questionnaires are not very useful in assessing the exclusiveness of open university studying. In this particular case the interviews were fairly short (1-2 hours). Interviewing adult students in greater depth would certainly yield much more detailed information about the unconscious structures of adult studying.

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PART V

Hannu Perho

EIGHT YEARS AFTER THE BEGINNING OF CLASS TEACHER EDUCATION. FOLLOW-UP FROM SELECTION TO WORKING LIFE

Eight years after the beginning of class teacher education. Follow-up from selection to working life

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The article examines the relationships between vocational orientation at the time of application to class teacher education and attitude to teacher's work and profession five years after the completion of studies. Ways in which the selection procedure, the mark given for teaching skill, and vocational commitment and satisfaction with career choice at the end of studies, are associated with later attitude to profession are also analysed. Motives for choice and vocational values and interests preceding studies are still highly predictive of satisfaction with profession and of vocational commitment eight years later.

1. Background of the study

The present study continues, in the form of a follow-up, the research I did for my doctoral thesis (Perho 1982). In my doctoral thesis I examined the vocational orientation of applicants to class teacher education and the ways in which that orientation and the selection procedure are associated with teaching skill, vocational commitment and satisfaction with career choice at the end of studies. The methodological frame consisted of an inquiry which, in accordance with the tradition of the abundant Finnish research on primary school teacher and class teacher education, was concerned with the reasons underlying the choice of teaching career, but, in addition, also with vocational values, interests and their hierarchy. The feature that most clearly distinguishes this research from the tradition which goes back to Koskenniemi (1965) is that vocational orientation was examined in terms of individuality and hierarchy. In Finland, the foundation for this kind of approach was laid down in an "Educational Career Study" (Häyrynen 1970). In my research I operationalized individual hierarchical orientation by applying Holland's

well-known definitions of congruence, differentiation and consistency. The approach was fruitful, for example, in the prediction of vocational commitment over a period of three years. By means of an interview I investigated the individual relationship between teaching and central values in life, and the significance of this relationship.

The entrance examination did not predict the criteria at the end of studies. But by using other predictors, teaching skill and satisfaction with career choice could be predicted well, and certainty of career choice or moral commitment (Etzioni) to profession very well.

Underlying the teaching skill of both men and women was achievement orientation, ambition and an appreciation of the external rewards of the profession. Among men, intellectual interest in education and other intellectual orientation were also associated with a good mark in teaching skill. I estimated that high achievement in teaching skill, especially among women, does not predict later professional success, since cues of achievement motivation and its concrete rewards are absent from the work. The absent and even negative associations reported in the literature between teaching skill and success in the field were interpreted in terms of the motivational background of teaching skill (see Perho 1982, 40-43, 261).

Indecision and randomness of career choice among women were strongly associated with weak commitment at the end of studies. A conscious and deliberate choice and an educational interest clearly exceeding other interests (congruent and, at the same time, differentiated orientation) were associated with strong vocational commitment at the end of studies. Orientation in the application phase was weaker in predicting satisfaction with career choice, but its background was similar to that of commitment.

The whole of the vocational orientation of men in the application phase fully "explained" the commitment criterion at the end of studies. All those whose educational interest clearly exceeded other interests (congruent-differentiated orientation) or whose interest model was of the type educational interest - artistic orientation (congruent and consistent) were, at the end of studies, certain that they had made the right choice, while others were not so sure. A realistic orientation in Holland's typology and the abandoning of one's ideal field in the application phase, as well as a late decision regarding the choice, were strongly associated

with uncertainty at the end of studies. Dissatisfaction with career choice at the end of studies was predicted by an inability to see the instrumental advantages of the teaching profession, by a clear orientation of interests toward things other than education and by a high realistic orientation.

Vocational commitment at the end of studies was generally more mature and well-founded than the estimation of the successfulness of choice before studies.

In my thesis I stated that the validation of the research requires a follow-up of class teacher graduates in working life (Perho 1982, 271).

The present research study describes roughly how vocational orientation in the application phase is associated with satisfaction with work and with vocational commitment eight years later. Ways in which the selection procedure, teaching skill, and commitment and satisfaction with career choice at the end of studies are associated with later satisfaction and commitment are also investigated.

Despite the great number of studies on the vocational motivation of prospective primary school and class teachers (see survey, Perho 1982, 34-39) there have been hardly any follow-up studies extending into working life in Finland. An exception is Koskenniemi's (1965) research, which also examined the motives of the application phase in the case histories of unsuccessful teachers. Koskenniemi's later follow-up of the same material (1982) 22 years after the completion of teacher education is concerned also with sociological aspects of the teaching profession.

2. Subjects

The subjects of the study were students who started class teacher education at the University of Joensuu in 1976 and completed it in 1979. The present study was carried out five years after the completion of studies. Nearly all respondents were either class teachers, special teachers or other teachers. According to Levinson et al. (1978), a majority of the subjects would in their life cycle have been in the comparatively stable phase of entering adulthood, where tentative choices

regarding profession, life companion, own values and life style have already been made. According to Katz (1977), the group would have passed the phase of putting down professional roots and gone on to a more independent phase of professional self-reform in which one's own approach to work is deepened and enriched. Nevertheless, the life phase with its structures varies according to sex and individual person. In the present study, for example, women have settled down in the profession more firmly than men (Väänänen 1986).

Table 1 shows the total number of subjects and the number of subjects taking part in the different phases of the study according to sex.

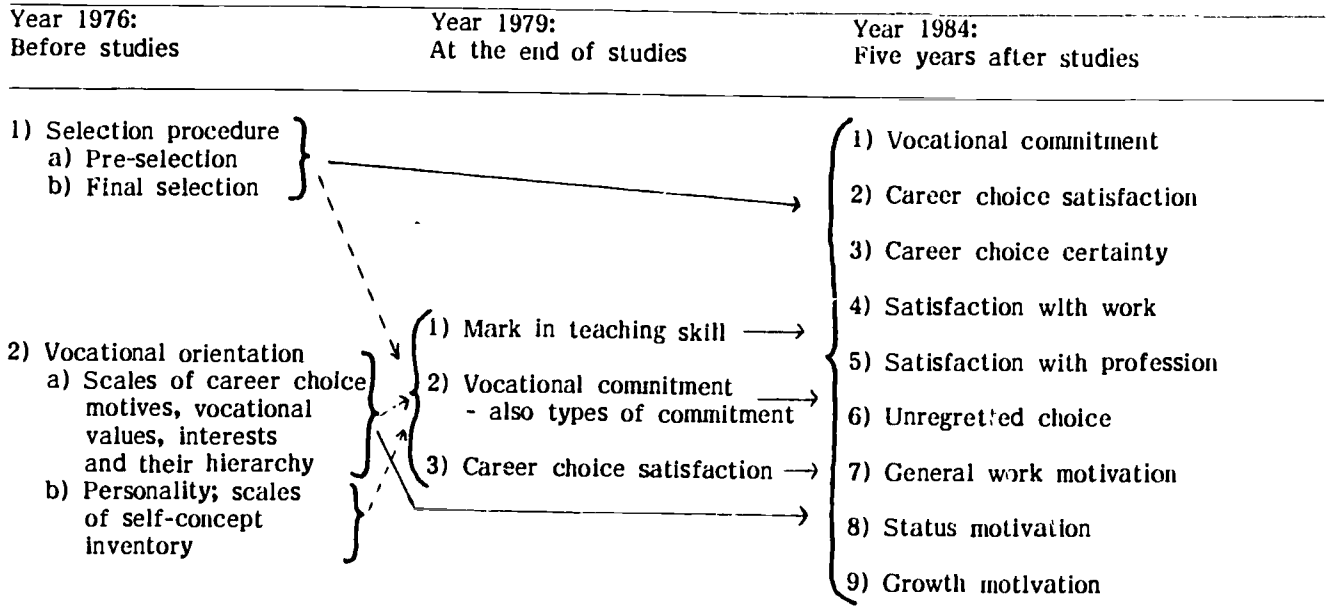
TABLE 1. Research subjects according to sex and year of research

Sex	Subjects	Year of research 1976		1979		1984	
		n	%	n	%	n	%
Women	44	44	100	34	77	35	80
Men	30	30	100	22	73	23	77
Total	74	74	100	56	76	58	78

At the time of application all subjects responded to the inquiry. At the end of studies the response rate was 76% and in the fifth year of employment 78%.

3. Research design and research variables

The main features of the whole research design are shown in Figure 1. Student selection for teacher education took place in two phases in accordance with countrywide practice. In the first phase screening was based on school achievement and achievement in the matriculation examination (=upper secondary school leaving examination). Extra points were given for relevant work experience, which could be either working as a teacher or working with children or adolescents. In the final selection or entrance examination the most important factor was the



Broken arrows indicate previous analyses (Perho 1982, 1988). Continuous arrows show the analyses of the present phase of the research study.

FIGURE 1. The main features of the research design

ability to organize and present teaching material. Extra points were given for voluntary samples of music and drawing. Since then, a short interview has been included in the entrance examination.

The selection variables of the application phase have been scored in the same way as in the screening procedure. Variables of vocational orientation, commitment and satisfaction with career choice are the same as in the thesis (Perho 1982, 85-111). Among the variables, it is possible to distinguish e.g. motives for selection, features of one's ideal profession, vocational interests and their hierarchy. Teaching skill is indicated by the mark given for teaching skill and the more normally distributed teaching skill score (see Perho 1982, 102-103). All these are explanatory variables. Variables to be explained are the same as in the thesis, i.e. the measured dichotomic criterion of moral commitment and the five-step variable of career choice satisfaction (Perho 1982, 108-110). In the present study the criteria include also certainty of career choice, satisfaction with work, satisfaction with profession, unregretted career choice, and two variables indicating each of three different motivation types: general work motivation, status motivation and growth motivation (Ruohotie 1980). According to previous analyses and my own estimate, the variable of moral commitment, unregretted choice and the variables of general work motivation are associated with personal interest and commitment to work and to its content. Certainty of choice, satisfaction with work, satisfaction with profession and satisfaction with career choice probably measure - especially among men - more broadly-based satisfaction which is also associated with the social status of the profession. Status motivation is associated with satisfaction with the social position of the profession and growth motivation with possibilities for growth and development experienced in the profession. The vantage point may here be selfish and not necessarily one based on pupils' interests.

4. Problems and hypotheses

The research problem is *whether the selection procedure, vocational orientation preceding studies, teaching skill at the end of studies, commitment to profession and satisfaction with career choice predict commitment to profession, satisfaction with work and with profession, and different aspects of work motivation after five years of work.*

The hypothesis is that the factors preceding studies that predicted commitment and satistaction with career choice at the end of studies (see Perho 1982, 189 and 207) will also predict later attitudes towards profession and work along the same lines. Teaching skill is expected to have a weaker capacity to predict the criteria than vocational orientation and commitment and satisfaction with career choice at the end of studies.

5. Results of the study

Detailed tables of the research results have been presented earlier (Perho 1988). The results presented here are based on statistically significant correlations.

5.1. *Results regarding women*

Among the variables of *pre-selection*, good achievement in the matriculation examination is associated with uncertainty of career choice and weak commitment. Teaching experience works in the opposite direction. When we here speak about associations we probably refer to opposite sides of the same thing. Students whose school achievement would in principle have made them eligible also for other fields regret their choice now, whereas those who were admitted just on the basis of their teaching experience are more satisfied. The conclusion is supported by the fact that the correlation between achievement in the matriculation examination and teaching experience is negative in the material of the

present study (Perho 1981). The total score of pre-selection does not predict attitude to work and profession.

The entrance examination is more positively associated with experiences in working life than with the criteria at the end of studies. The organization and presentation task and the total score of the entrance examination are associated with certainty of career choice, with unregretted choice and with growth motivation. The total score is further associated with commitment, satisfaction with work and general work motivation. The drawing sample is associated with both commitment and satisfaction with work.

Teaching skill is associated with general work motivation, growth motivation and satisfaction with career choice. Commitment and satisfaction with career choice at the end of studies predict general work motivation to the same extent as teaching skill, but variables of commitment and satisfaction to a higher extent.

Associations between *vocational orientation* and criteria which were expressed in the form of expectations (specifically, Perho 1988) are as follows:

Certainty of choice and commitment in the application phase are associated with both commitment and satisfaction, as expected. The associations are, however, weaker than the associations between commitment and satisfaction with career choice at the end of studies and the criteria of work attitude. This lends support to the interpretation of maturation of commitment and satisfaction during studies.

The time at which the choice of field became clear, and indecision are associated with dissatisfaction with profession, but not with actual commitment criteria.

Among the motives for career choice, a conscious and deliberate choice is associated with career choice certainty and satisfaction with work, randomness with dissatisfaction with profession. As expected, the abandoning of one's ideal profession because of external blocks is associated with dissatisfaction with work and choice and further with weak status motivation.

The appreciation of a secure future as a feature of one's ideal profession is associated with certainty of and satisfaction with career choice, in line with expectations. The profession of a class teacher is probably a secure alternative for women.

Educational interest is associated with variables of satisfaction. Interest in practical home economics is no longer associated with satisfaction. Interest in literary publication as one indicator of intellectual orientation is associated with dissatisfaction with profession.

Congruence as a parameter of total orientation predicts satisfaction with work, as expected. Thus, most satisfied with their work are those whose educational interest in the application phase exceeded the other five of Holland's interest tendencies.

Hypotheses were not expressed regarding any other variables than those discussed. Associations do, however, exist.

Application for higher education already before 1976 predicts satisfaction and commitment. This suggests that recurrent application reflects well-founded motivation.

The proximity of the institution of higher education and the status of the field, as motives for choice of field, are associated with status motivation. The underlining of the social relevance of the field is associated with weak growth motivation.

Among the vocational values, the appreciation of a good income and independent work free of supervision predicts weak growth motivation, while the appreciation of individual and original work predicts strong growth motivation. The appreciation of an opportunity to work with people and to direct others are associated with good general work motivation. Those who appreciate receiving recognition are, on an average, less satisfied with their profession.

A realistic orientation seems favourable from the viewpoint of satisfaction with work. This is contrary to Holland's theory and is probably explained by the fact that in the women's data realistic orientation is weak and, hence, not really an important orientation factor for anybody. Among indicators of realistic orientation, technical interest predicts both weak general work motivation and weak growth motivation. Intellectual orientation is now negatively associated with certainty of choice, satisfaction with profession and general work motivation. The negative associations of intellectual orientation are in line with Holland's theory (Perho 1982, 72). Holland's enterprising orientation and related economic-administrative and computational interests are associated with weak general work motivation and low status and growth motivation.

5.2. *Results regarding men*

Among the variables of *pre-selection*, the grade point average from school is associated with dissatisfaction with career choice and the achievement in the four compulsory subjects of the matriculation examination with vocational commitment. We get - however - a more correct picture of the significance of the matriculation examination by investigating the association between the overall mark and the criteria. The overall mark correlates with the criteria as follows: satisfaction with profession -.62, satisfaction with career choice -.46 and one of the two indicators of general work motivation -.58. Good achievement in the matriculation examination is thus associated with both dissatisfaction and weak general work motivation.

Good achievement in the organization and presentation task of *the entrance examination* is associated with weak work motivation. Success in the voluntary music test is associated with growth motivation. Overall success in the entrance examination is not associated with the criteria.

The teaching skill does not predict the criteria. Contrary to expectation, the teaching skill of men is thus not as strongly associated with the criteria as that of women.

Satisfaction with career choice at the end of studies is strongly associated with general work motivation. Commitment and satisfaction with choice at the end of studies have also other strong associations with the criteria, but the correlations are not significant, since the number of observations is limited.

Associations between *vocational orientation* and the criteria are examined in the same way as in the data regarding women; first the orientation factors that are expected to have associations with the criteria, then the others. It should be noted that the hypothesis concerning men were somewhat different from those concerning women.

A late decision regarding the field does not predict commitment, whereas it is associated with dissatisfaction with profession. Indecision is a good predictor of dissatisfaction with profession and career choice, and of weak work motivation.

The proximity of the institution of higher education as a motive for choice is, contrary to expectation, not associated with the criteria. The status of the field as a reason for career choice is associated with

good work motivation. The abandoning of one's ideal field is a strong factor of dissatisfaction with profession, but it is not - contrary to expectation - associated with indicators of commitment.

Among vocational values, the appreciation of leadership and of the realization of ideals no longer predict commitment or satisfaction criteria. Neither is the congruence of values and teaching associated with satisfaction. The realization of ideals, on the other hand, is associated with growth motivation.

Educational interest and the main indicators of artistic and realistic orientation are not associated with commitment criteria - contrary to expectation. Educational interest, on the other hand, is associated with high satisfaction with profession. Among indicators of realistic orientation, interest in a profession which enables one to work alone is associated with weak satisfaction with work and career choice, as well as with weak work motivation.

The congruence of orientation as a variable describing the hierarchy of interests, is associated with satisfaction with profession. Those whose educational interest exceeds other interests are most satisfied. As also predicted, the consistency of orientation is positively associated with commitment.

Variables other than those to which hypotheses were attached are also associated with the criteria.

Application also to other fields at the University of Joensuu is associated with high satisfaction with work. The certainty of choice preceding studies is clearly associated with satisfaction with profession, whereas weak commitment in the application phase is associated with strong growth motivation.

The possibility of passing the entrance examination and the randomness of choice as motives for career choice are factors of dissatisfaction with profession. Anticipated interest in studies and work is a factor of satisfaction with profession and strong work motivation. Scientific and theoretical interest in education as well as interest in the challenges of education are associated with a certain choice. Those who explained their choice by the likelihood of completing the degree experienced most appreciation and growth in their work.

Applicants, who valued most working with people are most certain that they made the right career choice. They are also the most satisfied

with the work and the profession and regret the choice least. Satisfaction with work is also associated with such ideals of work as variety and excitement, a good income and an opportunity to gain recognition. The last mentioned value is also associated with high commitment. The appreciation of a good income is further associated with status motivation.

Interest in youth work is associated with satisfaction with profession and with good work motivation. Intellectual interest and some of its indicators are positively associated with work motivation and growth motivation. Thus, the associations are opposite to those of women. Men who were interested in practical home economics are committed and they have a high work motivation. Teaching seems to suit to "soft men". Men who were socially orientated are satisfied with the profession. Those who appreciated an urban environment are satisfied with the work.

6. A discussion of results

When we evaluate the results it is good to bear in mind that a majority of the teachers taking part in the project had a strong positive motivation towards their work. The distributions of the criterion variables are therefore often skew. And because the project as a whole has to be viewed as a "case study" of one department and one cohort, generalizations have to be made with caution.

A disquieting feature among the selection variables is the way in which the matriculation examination predicts attitude to work. From 1976 to the early 1980s the achievement level in the matriculation examination has clearly risen among both men and women in class teacher education (Perho 1987). This is a result of the fact that class teacher education has been made longer and more academic. On the basis of the results of the present study we can later on anticipate problems in satisfaction with work and in commitment to work. It is, however, possible that the extension of the education to four years has raised and will continue to raise the social status and salary of class teachers, reducing problems arising from the fact that those who sell their matriculation examination as "dearly" as possible regret their choice of a teaching career.

Teaching experience preceding studies is now more positively associated with attitude to profession than during studies; but only among women. Positive associations are probably in part due to the fact that women with teaching experience had only moderate school achievement. Admission to other fields of higher education would have been difficult. In such cases, women do not regret having chosen teacher education.

The entrance examination seems to work better for women than might have been expected on the basis of the results obtained during studies. The organization and presentation task as well as the voluntary drawing test are positively associated with teacher's work. Is it possible that the organization and presentation task covers such qualities in women - e.g. courage and confidence - that are not rewarded in studies, but are of benefit in their work? Among men, the entrance examination as a whole is not associated with the criteria. Those men who did best in the organization and presentation task have - contrary to women - the weakest motivation for teaching. This probably stems from the fact that men's success in the organization and presentation task of the application phase was associated with Holland's enterprising orientation (Perho 1980). The verbally most fluent "economist-types" will probably not be happy as teachers.

Commitment and satisfaction with career choice at the end of studies were, as expected, better predictors of work and vocational motivation than teaching skill. Contrary to expectations, teaching skill predicted the criteria better among women than among men. It would seem that good teaching skill especially among women increases satisfaction with work and the feeling that one works in the right field. Research by Cortis (1975, 1979) showed similarly that teaching skill during studies predicted satisfaction with work even over a longer period. It could be that those whose teaching skill is very weak have to struggle and worry more than others (cf. Koskenniemi 1965, 409-419; Marklund 1968, 108-109).

The associations of vocational orientation to the different criteria of both commitment and satisfaction and work motivation strengthen the belief in the functionality of the methodological approach chosen in the research programme. The broadly-based approach to vocational orientation, which has links with theories of vocational choice and which emphasizes individual integration and organization of orientation, is fruitful.

The factors of vocational orientation in the application phase were still good predictors both of satisfaction with work and with profession, and of commitment to profession.

Underlying *women's* positive attitude to work and to profession were still the original certainty of career choice, a conscious and deliberate choice of field, an appreciation of a secure future, a high educational interest and the importance of education among interests. Weak commitment or dissatisfaction were still associated with indecision, randomness of choice and technical interest in the application phase.

Unlike the situation during studies, intellectual orientation was associated with an uncertain choice, dissatisfaction with profession and weak work motivation. It is possible that a teacher's work does not offer an opportunity for intellectual and reflective women to realize their interests. It must, however, be noted that those who have an intellectual approach especially to educational phenomena are no more dissatisfied than the rest. The associations between intellectual orientation and the criteria anticipate problems in work, since the intellectuality of female applicants has clearly increased from the mid 1970s to the early 1980s (Perho 1987). Hopefully, the more scientific teacher education and the professional practice based on it will in future correspond to the work style and attitude of intellectually orientated female teachers better than at present. The associations of enterprising orientation with weak work motivation and with weak status and growth motivation are understandable. A class teacher's work requires altruistic social qualities rather than manipulation and underlining of external rewards of the profession.

Underlying *men's* satisfaction with work and profession or their commitment, was still high educational interest as such and interest in education, which exceeds all other interests. The consistency of orientation is still associated with the commitment criterion, in line with expectation. Similarly, dissatisfaction or weak commitment were still predicted by a late choice decision or indecision and the abandoning of one's ideal field as a motive for choice. The status of the field as a reason for choice was associated with good work motivation. Realistic orientation, on the other hand, is only partly associated with negative attitude to profession and work. Interest in technology and in outdoor activities are neutral in relation to the criteria. Only a clear tendency to

withdraw in work correlates negatively with the criteria. Artistic orientation no longer predicts the criteria.

New predictors of a positive attitude to work were the well-considered, not random nature of application, interest in studies and work, intellectual interest in teaching and the certainty of being able to complete the degree, as motives for choice, appreciation of working with people and interest in youth work. Contrary to women, the intellectual orientation of men is positively associated with attitude to the profession.

A positive estimation of the social status and some external rewards of the teaching profession in the application phase predicts good work motivation. This may be due to the fact that a class teacher's profession means different things to men and women. For women it is a fairly well paid academic profession, whereas for men it is one of the most poorly paid among academic professions.

Especially the results for men seem to indicate that the association between vocational orientation and later satisfaction is a flexible one in that persons who are differently motivated to teaching, value and underline different aspects of the work and the profession. The rather different orientation backgrounds of growth motivation and general work motivation would seem to suggest this.

Although there are differencies between men and women, in general it seems that much of the satisfaction with profession and much of the commitment can still after several years of work be "explained" by vocational orientation preceding studies. Nevertheless, the content of the work with its problems (see e.g. Naeslund 1987) and the teacher's own life phase still play an important role in the way work is experienced.

In the future, the follow-up phase of the research study will be further elucidated by examining, among other things, how the 22 persons, of whom I have written case descriptions on the basis of interviews (Perho 1982), now feel about their work and their profession and how this is influenced by individual factors.

As far as I can see, the results of the follow-up have practical relevance for vocational counseling and for student selection for class teacher education. The latter I already have discussed in some detail elsewhere (see Perho 1987).

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Theory into practice 35

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